



Looking north in Grand Hall; in the foreground is seen the arrangement of the passenger car exhibits flanked by 25-foot Bermuda palms. The turret-shaped sign posts may also be seen. In the background is a huge painting of the entrance to the Palace of Nebuchadnezzar

The Boston Show

Most Elaborate Exhibition Ever Held in New England

By J. Edward Schipper

BOSTON, MASS, March 8—On Saturday, March 8, the doors of Mechanics' Hall were thrown open on the biggest and most elaborate automobile show that has ever been held in New England. Over the 105,000 square feet of floor surface were distributed more than 400 passenger cars and 1,116 useful automobile articles, the products of 232 accessory manufacturers. Last year's show, which exceeded every previous exhibition, had a total of 242 pleasure cars and chassis on exhibition. This year there are over 50 per cent. more cars than last year.

Chicago had a total of ninety-nine pleasure car exhibitors. New York had eighty-eight. Boston has 103 different makes on the floor. Chicago had 205 accessory exhibitors, twenty-seven less than Boston. New York had 340 accessory manufacturers who showed their products at the Palace or Garden. This is 118 more than Boston.

The Boston show, which used to be con-

Show Facts

¶ More than 400 passenger cars are distributed over floorspace of Grand Hall and Exhibition Hall

¶ Every inch of the 105,000 square feet of floorspace available has been taken up by cars or accessories

¶ Boston has 345 exhibitors and ranks second, New York having had 467 and Chicago 304 at this year's shows

¶ The decorations were done by renowned scenic painters and decorators at a cost of \$45,000

sidered the big accessory exhibition of the year, no longer holds sway in this particular. New York, with its multitude of small accessory plants scattered about the metropolitan district, exceeds it in this respect. As for a pleasure car show, however, the status is different. Boston exceeds both New York and Chicago in the number of exhibits. In total exhibits New York ranks first with 467, Boston second with 345 and Chicago third with 304.

Boston is the big dealers' show of the year. They come from all New England and the southern border of Canada to close agencies, to make arrangements for the approaching season and to confer with the Boston office which, in most instances, is the central distributing point for this section. The dealers' territory covered by the Boston show runs as far south as Bridgeport, north to the Canadian border and west to Pittsfield. Practically every dealer in this territory is represented at the show by one or more members



South end of Grand Hall, showing the magnificent painting of the Hanging Gardens of Babylon. These gardens were constructed by the Babylonian king to please his Medean bride and to satisfy her yearnings for the tropical splendor of her native land

of his selling organization. Advantage is taken of the time to hold conferences and the hotels in back-bay Boston are thronged with visiting members of the automobile and allied trades.

Mechanics' Hall does not lend itself readily to decorative effects but this year the committee has outdone itself. At a cost of \$45,000 the interior of the historic building has been transformed into a huge garden. Grand Hall, the main section of the building, forms the center of the decorative scheme. The motive of this section represents the hanging gardens of Babylon.

The Babylonian king in order to satisfy the yearnings of his bride, a Medean princess, for the luxuriant gardens of her youth transformed the barren wastes about the palace into a scene of tropic splendor. The main floor scene represents one of these gardens. An array of Bermuda palm trees 25 feet in height borders the center space while from the terraces of the hanging gardens illuminated waterfalls give a striking effect. At each end of the hall is a huge scenic painting. At the north end is the entrance to the palace. Nebuchadnezzar's tribute to his Medean bride, painted by Walter Burridge. In the center of this garden is an electric cascade which gives an intensely realistic effect to the work. The remainder of the building has been decorated on the scene of the gardens 100 years ago. Colonial pillars from which hang festoons of garlands and electric



The exhibits were labeled by a series of turret-shaped posts containing an illuminated semi-opaque glass sign. Swinging beneath the sign is a fern cluster which adds greatly to the decorative effect of the hall. The numerous sign posts of this nature diffusing a soft white glow gave a well-illuminated and rich appearance to the hall, forming a splendid setting for the cars

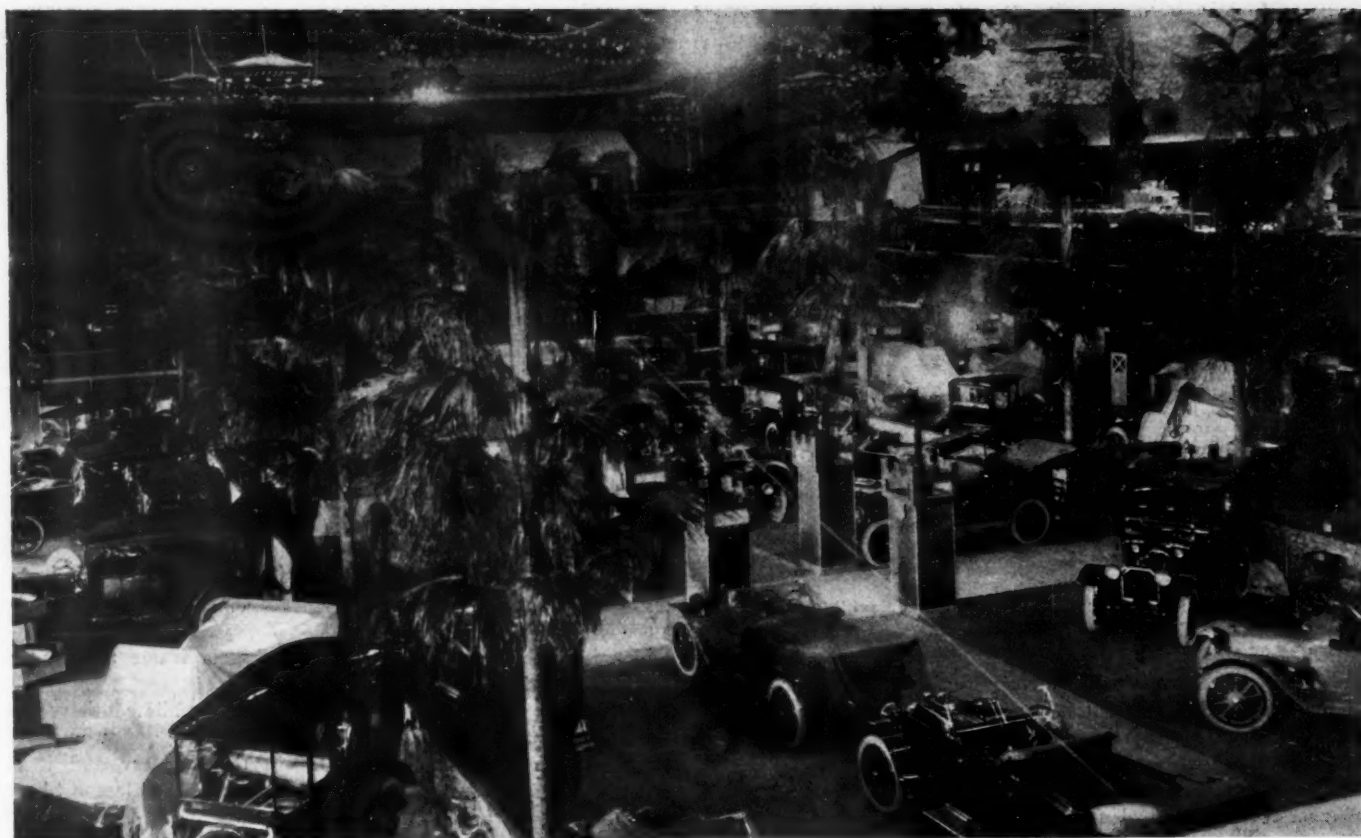
lights. The idea of separating the exhibitors throughout these spaces by the white picket fences, so common in colonial times, is in tasteful keeping with the general outdoor scheme.

More than 30,000 people saw the show on opening night. The total attendance at the show last year was 227,108. At the 1911 show it was 146,343. It is probable that last year's figures will be exceeded. Last year every car on the floor of the hall was sold at the exhibition. According to figures compiled by the management of the show 1,498 cars were sold as a direct result of the 1912 display.

Chester I. Campbell, manager of the show, has sent out over 3,000 letters to dealers inviting them to attend the show. It is stated that practically every dealer in the territory will respond. With very few exceptions these dealers bring prospects with them. Many have been invited to the show by the dealers themselves. The business predictions throughout the show are extremely optimistic.

The growth of the Boston shows, of which this is the eleventh, is of great interest and the following table shows the increase in attendance since the first was held in 1902:

Shows	Attendance
First, 1902	17,350
Second, 1903	30,000
Third, 1905	47,000
Fourth, 1906	51,000
Fifth, 1907	56,260
Sixth, 1908	69,371
Seventh, 1909	91,007
Eighth, 1910	107,000
Ninth, 1911	146,343
Tenth, 1912	227,108



General view of Grand Hall which illustrates the garden-like atmosphere created by the Bermuda palms. One of the most novel features is the waterfalls which rippled from the terraces to the pools on the main floor. Glass foundations make these fountains beautiful

The possibilities of New England as an automobile field are vast. With its large prosperous population, the pleasure car finds a ready sale throughout the entire territory. The roads in most of the states, where the natural difficulties due to mountainous country are not too great, are excellent.

There are at present 94,334 automobiles registered in the six states of New England. With its enormous population and with the number of large cities that are included in this section of the union, this does not represent half of what there will be eventually. Within the next 2 years the dealers will find that New England will purchase thousands of cars. The prosperity of the country and its accessibility will render it remarkably responsive to the vigorous campaign that the dealers of this section of the country are only beginning to wage. Massachusetts, including as it does Boston and other large centers, has the largest registration in New England. The others follow in the order named:

State	Registrations
Massachusetts	51,229
Connecticut	17,950
Maine	7,743
Rhode Island	7,565
New Hampshire	5,764
Vermont	4,183
Total	94,334

With its enormous population, New England can stand three times this number of cars. Connecticut, in spite of its magnificent touring country and fine roads, has less than seven cars to every

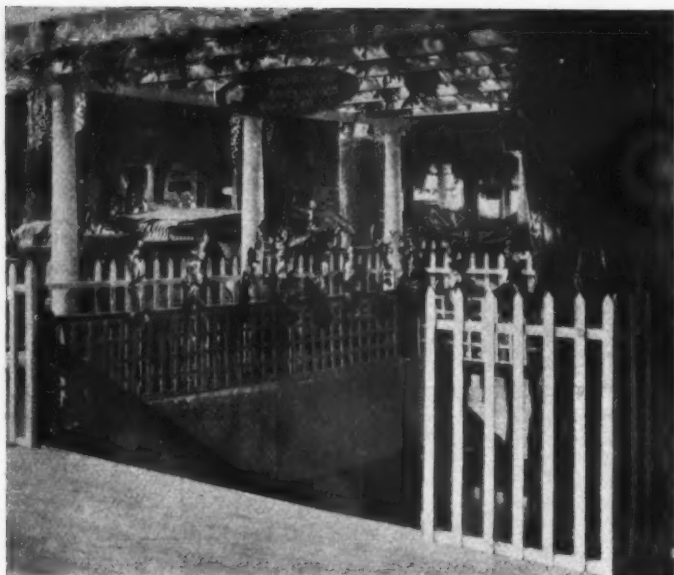


Exhibition Hall is arranged to represent the garden of a century ago. White picket fences serve to separate the different exhibits while old-fashioned hollyhocks, honey flowers and blue-bells cling to the fences. An out-door effect created by vine-clad arbors which practically cover the center aisle. The exhibits are grouped beneath the arbors and along the white picket fences which go to make up the effect of a garden

1,000 of its population. Massachusetts with its large number of people of the wage-earning class has over seventeen cars to every 1,000 people.

The field of the electric car in this vicinity is large. Boston, with its traffic difficulties, almost requires electric cars if women are to drive them through the streets. The impossibility of stalling in traffic, the ease of control and the accessibility and number of suitable charging stations renders them particularly desirable. The possibility of attending the theater in an electric, leaving the car parked in a suitable place and then, after the play is over, getting into the electric and going home, appeals to a large class of buyers who could afford to have electric as well as gasoline cars.

The accessory show in Boston is most complete although the many devices seen displayed on the balconies and in the basement were in the main familiar to those who have studied the situation this year, there were many new and useful implements with which the automobilists have been heretofore unacquainted. The Boston Show in spite of the fact that the number of accessories exhibited may not be as great as that in New York, is still looked upon as the big accessory show of the year. Throughout New England many prosperous plants are devoted entirely to the manufacture of inexpensive tools and equipment for the use of automobilists. These they show in Boston knowing that it is the one exhibition



Stair leading to basement from main floor of exhibition hall

which reaches both the dealer and consumer at the same time.

The big accessory houses of New England always have space at the Boston Show and it is rare that some of these concerns have not some new device of interest to the automobile user or to the garageman.

A fact which is worthy of attention is that a large number of accessories designed for specific low-priced cars were exhibited. Tire removers, lighting outfits, gasoline gauges for Ford, Metz and other small cars could be seen at the tables of all the jobbers' exhibits and in many instances these special accessories are shown at the booth of manufacturers.

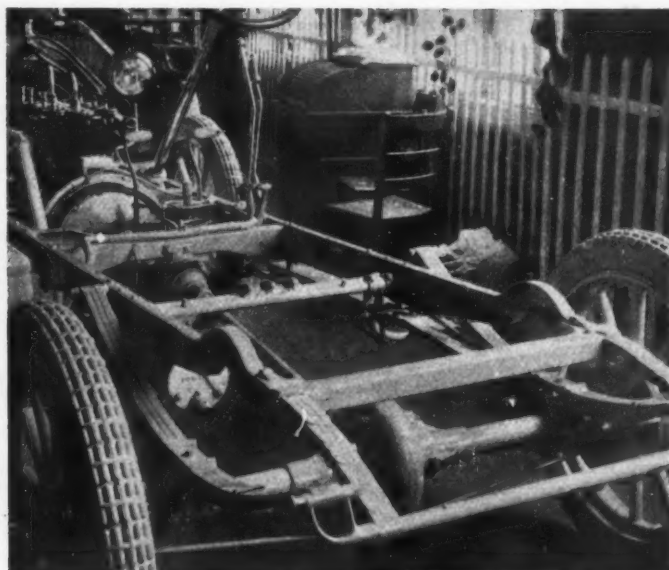
Exhibits of interest to a garageman are also numerous. In the basement there are a number of gasoline tanks and oil storage devices showing methods of handling the volatile fuel and other liquids in a cleanly and economical manner. There are large air compressors for garages to be seen and a carbon remover by means of which the carbon is burned from the cylinder by the use of a carbon-consuming gas.

Motorists' clothing is shown in the rooms just off the balcony around the main hall. It may be remarked that the exhibitors in this line did not follow the lead of the other exhibitors in making their exhibition seasonable. The fact that spring will be soon with us and that automobilists are now preparing for warmer weather was not noticed. This is evidenced by the fact that on every hand are to be seen fur coats and heavy gloves.

The bodies seen at the show are generally of the touring type, the closed cars being confined to the electrics and in a very few cases to the higher-priced gasoline car. The Locomobile company has a noteworthy exhibit in this line, a handsome town car finished in beautiful upholstery with silver mountings being shown.

Many roadsters of racy lines are to be seen evidencing the fact that this style of car is gaining in popularity. Fiat, Pathfinder, Stutz and others have distinct models shown which attracted much attention on opening night. These roadsters are of semi-racing design fitted in some cases with no windshield end in others with an elliptical shield clamped to the steering column. The tires are carried on the rear deck or on brackets in the rear of the car. The carrying of tires on the side has been practically eliminated in cars of the race-about type.

One car new to the shows on the big circuit this year is the Moyer. This car is unique owing to its peculiar spring suspension. The illustration on this page shows it clearly. The rear spring is what may be called a separated three-quarter elliptic. It is composed of a half-elliptic spring suspended between two oscillating cross bars which extend across the chassis, and a quarter-elliptic spring which forms the rear member and



Moyer car with novel spring suspension which attracts attention

which is attached at one end to the chassis frame and at the other end to the rear cross bar.

Out of the 103 makes of passenger cars exhibited there are not more than seven makes of electric. There are twenty-five large makers of electrical vehicles in this country and it is strange that more have not taken advantage of the Boston Show to exhibit their wares to the New England market. As has been stated the electric is popular in this part of the country and a big market is found for this type of vehicle. Those shown are of coupé design in most instances and make ideal cars for theater or shopping use or wherever ladies are driving through traffic. The electric exhibits at the Boston Show attract considerable attention and the salesmen have been kept busy answering inquiries ever since the doors were opened.

As at New York and Chicago the principal inquiry made by visitors to the booth of those exhibiting passenger cars relates to the cranking and lighting equipment. The design and construction of the car itself is taken for granted and the attention of the attending purchaser is focused largely on general appearance and equipment. Cars selling above \$1,000 are with few exceptions equipped as well as the much higher-priced makes, the only difference being in the luxuriousness of the upholstery and finish. As far as starters are concerned the electric predominates even in the lower-priced makes. Some of the higher-priced cars, however, are fitting an acetylene priming device in addition to the electric starter.

It is too early in the show to predict accurately its value from a business standpoint. It is the consensus of opinion, however, among dealers that the show is more seasonable from a selling standpoint than either that held at New York or Chicago. Touring cars bodies are far in the majority and it was stated by several that where purchases were made 95 per cent. would be of this type. With the approach of warmer weather the desire of owning an automobile becomes stronger and the enthusiasm created by the show is all that is needed to lead to many a purchase. Last year every car on the floor of Mechanics' Hall was sold before the doors closed, and with the ever-growing attendance it has been but natural that those exhibiting expect good results from a business standpoint.

While the show is going on at Mechanics' Hall an Importers' Automobile Salon is being held at Copley-Plaza Hotel, at Copley Square, Boston. The exhibitors are the Benz, Metallurgique, Lancia, Isotta-Fraschini, De Dion, Bouton, Minerva, Mercedes. These are all selling more than one chassis. Benz and Lancia each having two while Mercedes has nine different models, one of which is a Knight. Isotta-Fraschini has five. This ball-room exhibition is being attended by many prominent Bostonians.

Twenty Racing Cars Entered in French Grand Prix

PARIS, FRANCE, March 5—All entries are now closed for the French Grand Prix race at Amiens on July 12. The list comprises twenty cars, of which two were entered at the last moment on payment of double fees. These eleventh-hour entrants were a six-cylinder Excelsior, which will probably be driven by Arthur Duray, and a Th. Schneider to be handled by Rene Thomas, who was a member of the Peugeot team last year. It was expected until the last moment that the Fiat would enter a team of cars for this race. The German firms, Mercedes, Opel, and Benz also boycotted the contest and although the Belgian and English agents of the Mercedes company made every effort to put a team of cars in the race the factory persistently refused to give their consent. Although the number of entries is small, this fuel consumption race will not be lacking in interest, for a very fast short course has been selected in the suburbs of Amiens, and the Racing Board of the French Club has made such arrangements that the event will be more spectacular than any previous race held in France. The entry list, with the names of the drivers so far as they are known, is as follows:

1 Sunbeam, Victor Rigal	11 Itala, —
2 Sunbeam, Gustave Caillios	12 Itala, —
3 Sunbeam, W. Lee Guinness	13 Itala, —
4 Sunbeam, Darius Resta	14 Opel, Joerns
5 Peugeot, Georges Boillot	15 Th. Schneider, Champoiseau
6 Peugeot, Jules Goux	16 Th. Schneider, Gabriel
7 Peugeot, Paul Zuccarelli	17 Th. Schneider, Rene Thomas
8 Delage, Bablot	18 Th. Schneider, —
9 Delage, Albert Guyot	19 Excelsior, Christiaens
10 Mathias, Mathias	20 Excelsior, Arthur Duray

The French light-car race will be held at Boulogne, Sunday, September 21, and is for cars of 183-inch piston displacement, the maximum weight being 1,984 pounds. The circuit is 32.3 miles and the distance is 452 miles, or fourteen laps.

Hudson Wins as Ice Racer

STOCKHOLM, SWEDEN, March 6—America scored its first motor car victory in Sweden during the annual winter ice racing classic.

The first prize for the kilometer race was captured by a beautiful 1913 Hudson car. The distance of 1 kilometer from a standing start was covered by the fleet automobile in 40 seconds. The rate of speed was a mile in approximately 65 seconds.

An American car won second position at the finish, the Cadillac finishing the kilometer in 45.4 seconds.

Quakers Prepare 30-Day Run

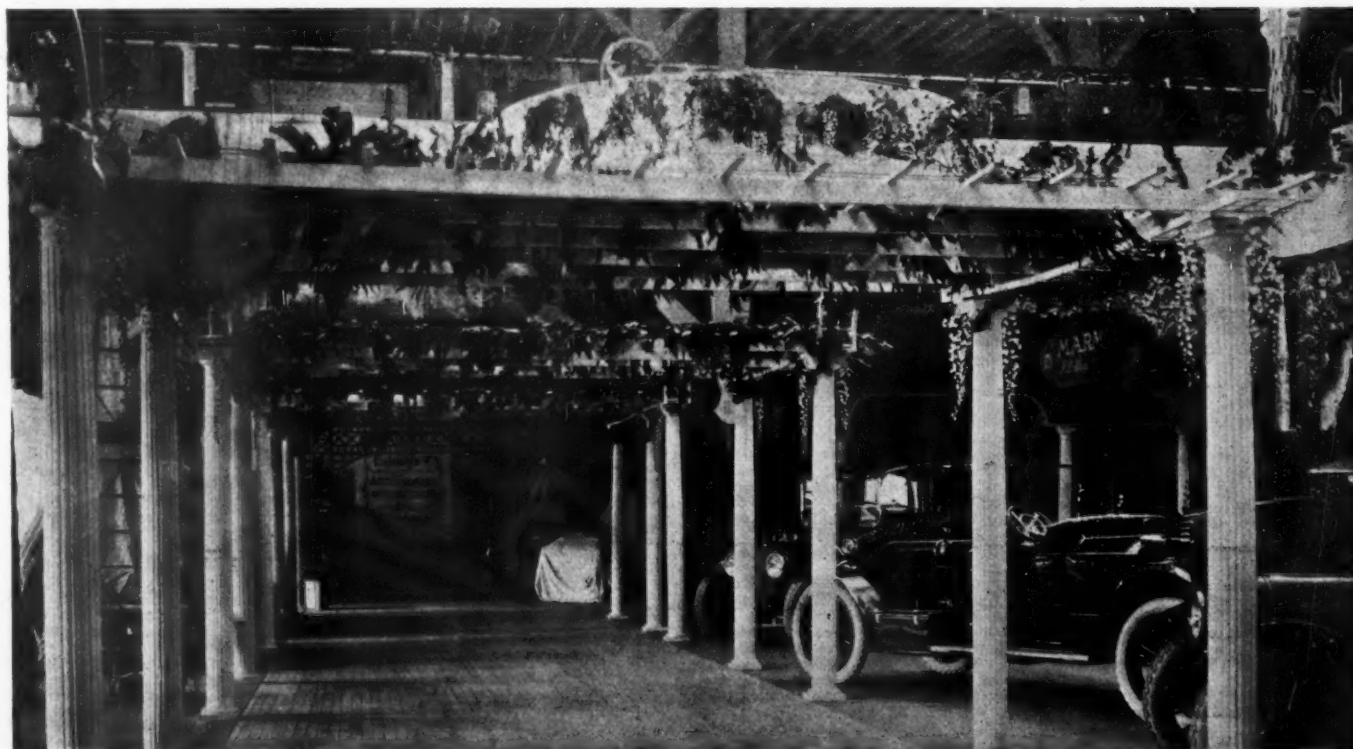
PHILADELPHIA, PA., March 10—The touring information department of the Automobile Club of Philadelphia 2 days ago started a Multiplex car on a 30-day, sealed-bonnet run. The car will travel from Philadelphia to Harrisburg and back, making 210 miles every day and the seal on the bonnet will be broken once in every 1,000 miles so as to permit of tightening up the dynamo and fan belts.

Smada Car for May 30 Race

INDIANAPOLIS, IND., March 10—With twelve formal entries to date the entry list for the 500-mile race at the Indianapolis Motor Speedway, May 30, looks very promising. The latest entry is by F. L. Adams of this city who will drive a specially built car known as the Smada. The car will have a four-cylinder motor, with the cylinders 3.5 by 5 and a piston displacement of 384.8 cubic inches.

Raymond Heads Badger Contests

MILWAUKEE, WIS., March 10—William H. Raymond, president of the Wisconsin State Automobile Association during 1912, has been designated as Wisconsin representative on the contest board of the association, thereby supervising all sanctioned contests to be conducted in Wisconsin during 1913. Mr. Raymond is treasurer of the Milwaukee Automobile Club.



Corridor with colonial pillars leading to stair to balcony. The out-door effect of the vines may be gathered from this illustration

Akron Strike Conditions Becoming Normal

Leaders of the I. W. W. Still Struggling To Keep the Remnants of Their Organization Together

Tire Plant Officials State That Fully 75 Per Cent. of the Strikers Are Back at Work

AKRON, O., March 10—Local and imported I. W. W. leaders are still struggling to keep the remnants of their organization together in connection with the rubber strike in this city. However, hundreds of strikers who have been marching under the I. W. W. flag a week ago have broken away and are now back at work. The strike leaders claim 5000 followers, but their strength is about 1000, as shown by their parade last Saturday, and of these 1000 in line 300 were imported and another 300 had never seen the inside of a rubber factory.

At the Goodrich, Goodyear, Firestone and other local plants the head officials state that hundreds of men have returned to work and that conditions are fast becoming normal. Goodyear has announced that night shifts will start at once. In general the manufacturers claim that of the 25,000 factory help, fully 75 per cent. are back at work. There are hundreds of others who are apparently afraid of being attacked if they return to their jobs.

Strikers Are Still Violent

Three hundred reserves are here from all over the country and are known as the Strong Arm Squad. For nearly a month the I. W. W. leaders have been preaching violence. They have said that "other countries have been overthrown and that the United States must be overthrown." They have carried red flags through the streets and have defied the police. They have prepared a new scale and have sent it to the manufacturers. The demands made by the strikers have been characterized as absurd.

Since the strike commenced the first real violence occurred Friday night when the strikers, 500 in number, gathered at the Goodrich plant and defied the police to move them on.

Saturday noon it was announced that the leaders would "put on the San Diego work." A parade started for the Goodrich plant. Police and deputies under Sheriff Ferguson charged the strikers after they had refused to move on. A fierce fight followed. Clubs and rocks were used by the strikers and the police had to resort to their clubs. After the charge was over it was found that many had been injured. One man was taken to the hospital. The police made many arrests.

Sunday afternoon the I. W. W. strikers and the strong-arm squad held a meeting. They denounced the police and said they would continue to defy the law. Orders were issued to march down on the Goodrich again. The police and deputy sheriffs made preparations to meet any emergency that might arise.

In the meantime the Senatorial Probe committee is yet at work. A midnight session was held Saturday after an all day session. The senate committee expects to complete its investigation this week. Up to the present time F. A. Seiberling, president of the Goodyear Tire & Rubber Company, and H. S. Firestone, president of the Firestone Tire & Rubber Company, are among the manufacturers who have been before the senate probe committee. A dozen or more of the strikers and a few of the I. W. W. leaders have also testified before the state committee. Among the leaders was George H. Speed, chief organizer of the I. W. W. Mr. Speed closed his testimony before the state committee with these words: "There is but one bargain that the I. W. W. will make with the employing class—Complete surrender of all control of industry to the organized workers. In short, the I. W. W. advocates the use of militant direct action tactics to the full extent of our power to make good."

This defiant statement was like the dropping of a bomb in the senate probe room. Members of the committee openly commented on it. Mr. Speed told the state committee that the factories belong to the strikers and that they would take them.

So far but one witness has testified before the committee that has in any way had a tendency to show that the I. W. W. strikers have any grounds for grievance. That witness was a girl who was before the committee Saturday night. She testified that one day she received 32 cents for 10 hours on piece work. It was also shown that she was sickly and had often been in the hospital at the plant. Another girl testified that her average pay for 2 weeks was \$23. One of the I. W. W. leaders who has been before the state committee and testified that conditions are bad in the factories has since denounced the I. W. W. and has withdrawn from the order.

H. S. Firestone, president of the Firestone Tire & Rubber Company, was before the committee all day Saturday. He testified that the average monthly earnings of his employees, outside of the superintendents, department foremen and assistants on salary, for the month of January was \$66.65. He placed the average monthly earnings at \$64.95.

Mr. Firestone said that while he was at all times ready to meet with his employees that he would never meet with any committee from the I. W. W. He told the senate committee that he had what he considered to be the best rubber plant in the country. He invited the state committee "to come and see for yourselves." Other manufacturers told the committee the same thing. The committee will make a tour of investigation some day this week.

Members of the Grand Army have become so incensed at seeing the red flag carried through the streets by the I. W. W. men that the former commander of Puckley Post, R. F. Palmer, has made this announcement: "I am authorized to announce that the services of 200 members of the local G. A. R. are at the service of the sheriff to assist in putting down this riot of Red Revolutionists in Akron. Let us have peace first. We can settle our differences afterward."

Following are the demands made by the strikers at Akron:

- 1st. That all employees now on strike shall be reinstated in their old positions and not be considered as new employees.
- 2nd. That the union workday shall be one of eight hours, six days in the week.
- 3rd. That all workers shall be paid double time for overtime.
- 4th. That all male and female employees shall be paid not less than 22½ cents an hour.
- 5th. That all male inspectors shall be paid not less than 55 cents an hour.
- 6th. That all female inspectors shall be paid not less than 30 cents an hour.
- 7th. That all inspectors shall be experienced men and women.
- 8th. That all tiremen, machine men and finishers shall be paid not less than 55 cents an hour.
- 9th. That all apprentices in the pit shall be paid not less than 30 cents an hour.
- 10th. That all men curing tires shall be paid not less than 60 cents an hour.
- 11th. That all truckers trucking tires or cores shall be paid not less than 60 cents an hour.
- 12th. That all tire buffers, cementers, treaders or wrappers shall be paid not less than 55 cents an hour.
- 13th. That all tube builders, ply cutters, or tread cutters shall be paid not less than 50 cents an hour.
- 14th. That all stock carriers shall be paid not less than 45 cents an hour.
- 15th. That all calender men shall be paid not less than 50 cents an hour.
- 16th. That all wind-up men shall be paid not less than 55 cents an hour.
- 17th. That all mill men shall be paid not less than 50 cents an hour.
- 18th. That all wind-up men shall be paid not less than 55 cents an hour.
- 19th. That all mill men shall be paid not less than 50 cents an hour.
- 20th. That all feed men shall be paid not less than 45 cents an hour.
- 21st. That all wind-up helpers shall be paid not less than 42½ cents an hour.
- 22nd. That all extra helpers on calenders shall be paid not less than 42½ cents an hour.
- 23rd. That all tire men shall be paid not less than 25 cents an hour to start.
- 24th. That experienced tire men shall be paid not less than 55 cents an hour.
- 25th. That electricians shall be paid not less than 40 cents an hour.
- 26th. That all first class electricians' helpers shall be paid not less than 30 cents an hour.
- 27th. That all second class electricians' helpers shall be paid not less than 25 cents an hour.
- 28th. That all electricians' apprentices shall be paid not less than 20 cents an hour.
- 29th. That all oilers and motor tenders shall be paid not less than 27½ cents an hour, and that electricians shall have double pay for Sunday and holiday work.
- 29th. Steam fitters, pipe fitters shall be paid 45 cents an hour.
- 30th. Steam fitters' helpers shall be paid 35 cents an hour.
- 31st. All straight wrappers, cross wrappers, pulling and blowing on tubes and cutting tubes shall be paid 50 cents per hour.
- 32nd. Bag rollers and pulling tubes shall be paid 40 cents an hour.
- 33rd. All first-class machinists shall receive 60 cents an hour.
- 34th. All erectors and bench hands shall receive 50 cents an hour.
- 35th. All handy men shall receive 40 cents an hour.
- 36th. Machinists and helpers shall receive double time for Sundays and holidays.
- 37th. All men employed making beads shall receive 50 cents an hour.
- 38th. All foremen shall receive not less than 50 cents an hour.
- 39th. All motorcycle tire builders, whether hand or machine men or finishers, shall receive the same as automobile tire men—55 cents an hour.

All girls working in rubber factories at flat rates and no piecework shall receive not less than \$14 per week.

If working on a piecework basis they shall receive a 25 per cent. increase over the standard piece in their respective departments in January, 1912.

Any and all departments not represented in the foregoing scale, either male or female employees—shall receive an increase of 25 per cent. over standard price for piecework in January, 1912.

When the company is in any way at fault for employees not putting out required amount of work per hour, they shall receive the usual price per hour as when running full capacity.

All day work labor shall be rated at not less than 30 cents.

Wages Are Higher Each Year

In an open letter to the public Mr. Frank A. Seiberling, president of the Goodyear Tire & Rubber Company, has said: "Every year since we have been in business the average wage paid our people has been higher than that of the preceding year and 1913 will be no exception. Our record for fair treatment in the past is a guarantee for the future. Akron's industries have already been sufficiently crippled and its people have suffered enough distress to satisfy any one with a sober judgment that nothing of value can possibly be gained by a continuance of existing conditions. Let us all get to work again, and the time will show that most of our troubles have been imaginary and that those that are real will be fairly adjusted in the ordinary course. Perhaps one feature of value has come out of it all; namely, the pricking of the bubble of fictitious values on the stocks of the various corporations. Speculators have carried the value of Goodyear common stock to a basis of \$465 per share. It is

Washington Roads Convention a Success

now around \$350, while its intrinsic value is approximately \$125. Let this good work go on, and we will not have as much false reasoning when the fictitious basis of value has been properly exploded."

Mr. Seiberling was before the state committee an entire day. He reviewed the history of his plant and urged the committee not only to come and see for themselves but to have their expert accountant look over the books of the company. He denied the insinuations and charges by the strikers that his employees were poorly paid, that the sanitary conditions were bad, that his employees were unfairly treated and that a blacklist was in vogue at his plant.

In his testimony before the state probers Mr. Seiberling said: "I don't think there ever was a company started in Akron that has made such a record as that of the Goodyear company. We started with practically nothing and we have built up a great business. We have not one drop of water in our security out. We did a \$25,000,000 business last year and it took \$17,000,000 capital to handle the business."

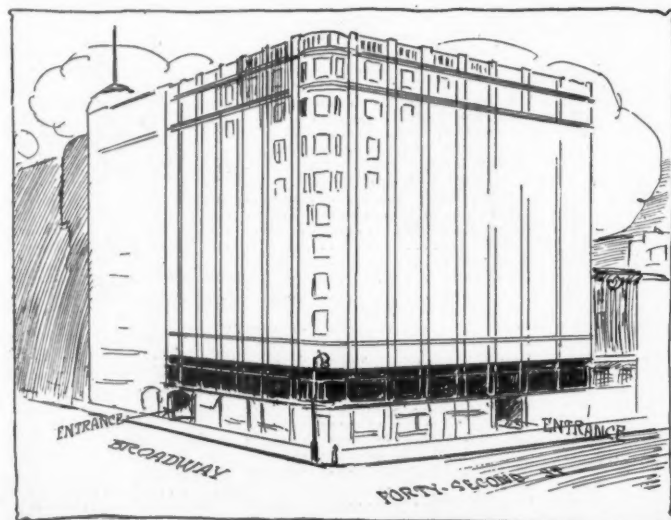
Mr. Seiberling, as did also Mr. Firestone, denied emphatically that there is a combine on among the rubber men of Akron to maintain prices. Mr. Seiberling told how his company has spent \$20,000 in installing a water system at his plant and that a hospital was built on top of one of the buildings at an expense of \$6,000. Dining rooms have also been installed. He also told of the establishment of a welfare department at his plant where 6000 people are employed at the high point.

"We have in the United States," said Mr. Seiberling, "approximately ninety concerns engaged in all kinds of rubber business, with a capitalization of approximately \$300,000,000, doing a volume of business approximating \$250,000,000. We have in Akron a capitalization approximating \$110,000,000, doing a business of \$90,000,000, divided among seven concerns."

Form New York Automobile Center

NEW YORK CITY, March 10—The Automobile Center, Inc., has been formed in order to give New York a permanent accessory exhibition at a locality where it is bound to attract the attention of a large number of people interested in automobiles. The second floor of the Longacre Building, Broadway, Forty-second street and Times Square, has been selected for this purpose. The floor has a floorspace of more than 10,000 square feet, with 103 feet frontage on Broadway and 115 feet on Forty-second street. The floor is divided into a number of spaces by the nature of its construction, the ceiling being supported on columns.

Due to its location at a corner where about 750,000 people pass during a day, the Automobile Center affords a bright outlook. The spaces will be rented to various accessory makers from week to week, and even now, 2 weeks in advance of the opening of the place, 65 per cent. of the space has been disposed of. The place will be open daily from 8 a. m. to 12 p. m., being accessible and attractive to the majority of passengers arriving on the New York Central, Pennsylvania and Long Island railroads, to say nothing of people on Broadway. Another scheme is a service for assisting cars having accidents within 30 miles of the city.



The entire second floor of the Longacre building at Forty-second street and Broadway is to be occupied by the proposed automobile center

Delegates from Various Good Roads, Civic, Motoring and Other Organizations Were In Attendance

National Construction of Roads Was the One Thought—Senators and Congressmen-Elect Give Addresses

WASHINGTON, D. C., March 7—The 2-day convention called for federal aid in good roads construction at Hotel Raleigh, in this city, came to a most successful conclusion this evening. Delegates from various good roads, civic, motoring and other organizations were in attendance from forty-two states in the union. Many senators and congressmen-elect were present, and a portion of 1 day entirely given over to their addresses on the subject of national road construction.

This convention will be recorded as one of the most successful in the history of the national road-construction movement in that it was attended by delegates who are working tooth-and-nail on some good roads movement in their own locality. Some of them are presidents of local highway organizations for cross-state or other inter-territorial highways; several are representatives of civic clubs and chambers of commerce that are actually building roads. This was a convention of business road men who came inspired with a single purpose, namely, securing national construction of roads. Because of this every session was well attended. Thursday's sessions began promptly at 10 o'clock and ended at midnight. Today's sessions were equally businesslike.

The legal aspect of national road construction received much attention and it was settled to the satisfaction of all that the building of national highways and the maintenance of them by the Federal Government does not in any way interfere with the constitution, but rather that power is given in the constitution for the construction and maintenance of such highways. Lawyers, senators and congressmen were equally agreed on this.

The first essential in securing national road construction is the proper presentation of the question before Congress. At present the only avenue of presentation is through the standing committee of the Department of Agriculture. That there should be a standing committee on national road construction and maintenance was accepted by all, and the first step in securing such a committee was taken by the committee on resolutions, which drafted the following, which was adopted:

"WHEREAS, Federal aid for good roads has become of such national interest and importance, and whereas the second national aid for good roads convention feels that this subject should be resolved by Congress with the greatest care, therefore, be it resolved, that Congress be respectfully requested to create a standing committee on national roads."

Further resolutions adopted were: "That we recommend our federal government to build and maintain an inter-state system of highways connecting the capitals of the various states and with the national capital." And be it further resolved: "That we advocate the creation wherever they do not now exist of effective state departments of highways in the various states, and that a copy of this resolution be forwarded to the governor of each state."

One of the most important aspects of the convention was the various reports from presidents of more than a dozen of the highway associations which have been organized during the last year for the improvement of state, territorial and inter-territorial highways. Among these organizations represented were: National Trails Ocean-to-Ocean Road, Quebec-Miami International Road, Lakes-to-Gulf Road, Meridian Road, Pacific Highway, Southern Transcontinental Highway, Santa Fé Trail, Memphis-to-Bristol Highway, Cross Arkansas Highway, Omaha-Denver Good Roads Association, Platte Valley Transcontinental Road, Iowa River-to-River Road, Crest of the Blue Ridge Highway and Park-to-Park Road.

Weed Infringement Suits

Whittaker Chain Tread Co. and E-Z-On Chain Tire Protector Co. Are Defendants

Complainant Recently Obtained Preliminary Injunctions Under Parsons Patent No. 723,299 on Chain Grips

BOSTON, MASS., March 10—The Weed Chain Tire Grip Company has recently obtained preliminary injunctions under Parsons patent No. 723,299 on chain grips against the Whittaker Chain Tread Company, in Boston and against the E-Z-On Chain Tire Protector Company in Chicago.

The papers in the Whittaker suit show that the Whittaker company has for some time been making and selling the Whittaker, Besdam, Empire and other chain grips. The Weed Chain Tire Grip Company brought suit some time ago against the E. J. Willis company in New York, a distributor of the Whittaker company's grips. The defense of this suit was assumed by the Whittaker company and its officers, Stillwell G. Whittaker and Clinton E. Hobbs. The Willis suit was brought to a final hearing in the summer of 1911 and a decree for permanent injunction and accounting issued by Judge Lacombe in September, 1911. In the early part of 1912 the decree was made final by the fixing of the amount of profits, damages and costs recoverable by the Weed Chain Tire Grip Company by reason of the infringement by the Willis company. An appeal was taken by the Willis company, but has not been actively pushed and is still pending in the Court of Appeals. Having made various endeavors to persuade the Whittaker company and its officers to appear openly in the Willis suit and to get the Willis appeal to an early hearing, the Weed Chain Tire Grip Company finally commenced a new suit against the Whittaker Chain Tread Company, Whittaker and Hobbs in Boston and moved for a preliminary injunction. The motion was argued before the Honorable Frederic E. Dodge on February 27, and early in March Judge Dodge handed down his opinion reviewing the numerous cases in which the Parsons patent had been sustained and held to be entitled to a broad scope, found the Whittaker company's grips to be within the Parsons patent, and directed the issuance of a preliminary injunction.

Mohawk Buys Stein Tire Plant

AKRON, O., March 10—The Mohawk Rubber Company has been organized at Akron, O., and has bought the Stein Double Cushion Tire Company plant and machinery. The new company is organized with a capitalization of \$350,000; \$250,000 common stock and \$100,000 7 per cent. cumulative preferred stock, redeemable at 110 with accrued interest after January 1, 1916. The new company has been organized without any water in the stock. The plant is located in east Akron, near the factory of the Goodyear Tire & Rubber Company. It consists of a 3-acre tract of land, a brick factory in good condition, with switching facilities, and free water rights, having a capacity of between seventy-five and one hundred tires per day. The Stein company has discontinued and liquidated its business.

Grabowsky Creditors Get 20 Per Cent.

DETROIT, MICH., March 10—The Security Trust Co., trustee in bankruptcy for the Grabowsky Power Wagon Co., is now returning to creditors of the defunct Grabowsky concern a dividend of 20 per cent., providing they have filed valid claims. An additional dividend of about 15 per cent. will be distributed to

wind up the remaining assets when such action is ordered by the Federal court.

The Grabowsky concern was adjudicated a bankrupt in November last by Judge Tuttle in the Federal Court, and at the time of the appointment of the Security Trust Co. as trustee, the liabilities totaled about \$400,000. The plant was later sold to the Edward G. Budd Mfg. Co., maker of automobile bodies, for the sum of \$110,000, while the Seitz Automobile and Transmission Co., Wyandotte, Mich., purchased the physical assets, including machinery, patents, cars and parts for \$55,000. These sums, together with the small amount realized from outstanding accounts, are the basis of the present dividend distribution.

DETROIT, MICH., March 8—At a special meeting of the stockholders of the Lozier Motor Co., to be held on March 19, the capital stock of the company will be increased from \$3,000,000 to \$5,000,000, according to a statement issued by President H. M. Jewett, who gives as a reason for the increase the necessity for extending the manufacturing facilities, the large sales of the light six having over-taxed the present plant.

The Lozier concern's present capitalization consists of \$2,500,000 in common stock and \$500,000 in 7 per cent. preferred. The contemplated increase is \$1,000,000 common and \$1,000,000 preferred. It is stated that the greater portion of the issue will be taken by the directors of the company.

COLUMBUS, O., March 10—According to the report of appraisers Julius F. Stone, J. F. Hatcher and Paul T. Norton, named by the court to appraise the assets of the Columbus Buggy

Automobile Securities Quotations

A general decline all along the line of automobile and kindred stocks marked developments this week. There was hardly a security quoted in New York that did not drop from 1-2 to 5 points, with the exceptions of Firestone, the common stock of which rose 2 points and the preferred 3; and of Chalmers common, which dropped 20 points during the week. The Akron situation being well nigh normal once more lent strength to the various rubber and tire manufacturing securities, although these dropped generally and slightly, with the exception of the Firestone issues.

	1912		1913	
	Bid	Asked	Bid	Asked
Ajax-Grieb Rubber Co., com.	..	..	150	170
Ajax-Grieb Rubber Co., pfd.	..	..	95	99
Aluminum Castings, pfd.	..	..	98	101
American Locomotive Co., com.	36	37	35 1/2	36
American Locomotive Co., pfd.	106	107	104	106
Chalmers Motor Company, com.	..	..	115	125
Chalmers Motor Company, pfd.	..	..	98	102
Consolidated Rubber Tire Co., com.	12	20	19	22
Consolidated Rubber Tire Co., pfd.	30	40	..	83
Firestone Tire & Rubber Co., com.	200	205	292	300
Firestone Tire & Rubber Co., pfd.	108	110	105	107
Garford Company, preferred.	..	..	98	100
General Motors Company, com.	32	33	30	32
General Motors Company, pfd.	77	78	75	77
B. F. Goodrich Company, com.	..	..	39 1/2	40 1/2
B. F. Goodrich Company, pfd.	..	..	98	100 1/2
Goodyear Tire & Rubber Company, com.	338	342	385	390
Goodyear Tire & Rubber Company, pfd.	108	110	102	103
Hayes Manufacturing Company.	..	..	..	90
International Motor Co., com.	..	..	5	10
International Motor Co., pfd.	..	..	35	45
Lozier Motor Company.	..	..	..	25
Miller Rubber Company.	..	..	185	195
Packard Motor Company.	104	107	..	103
Peerless Motor Company.	..	..	120	125
Pope Manufacturing Co., com.	40	42	22	25
Pope Manufacturing Co., pfd.	74	76	63	68
Reo Motor Truck Company.	8	10	11 1/2	12 1/2
Reo Motor Car Company.	23	25	20 1/2	21 1/2
Rubber Goods Mfg. Co., pfd.	100	105	104	106
Studebaker Company, com.	..	..	27 1/2	29
Studebaker Company, pfd.	..	..	86 1/2	90
Swinehart Tire Company.	..	..	95	102
U. S. Motor Company, com.	..	..	..	8
U. S. Motor Company, 2d pfd.	..	..	..	33
U. S. Motor Company, 1st pfd.	..	..	..	65
U. S. Rubber Co., com.	48	48 1/2	60	60 1/2
U. S. Rubber Co., 1st pfd.	110	110 1/2	104 1/2	105 1/2
White Company, preferred.	..	..	103	108
Willys-Overland Company, com.	..	..	62	67
Willys-Overland Company, pfd.	..	..	92	98
Fisk Rubber Co., com.	..	..	..	..
Fisk Rubber Co., pfd.	..	..	100	103

Company, of Columbus, O., now in the hands of Receiver McLaren, if the concern continues to operate under efficient management and is not thrown into forced sale, the corporation is solvent. The figures showed the assets to be valued at \$892,935.53 which is only about half of the valuation given for the assets at the time of the receivership, January 18.

In arriving at the valuation the gasoline cars were appraised at but 50 cents on the dollar because of the inevitable difficulty in disposing of the completed product.

PONTIAC, MICH., March 10—At a recent meeting of the directors of the General Motors Truck Co., Pontiac, Mich., the capital stock was increased by \$250,000 all of which is owned by the General Motors Co., of which the Pontiac concern is a subsidiary. Prior to this time the Truck company was simply a selling company but it now takes complete charge of its manufacturing. It is the successor to the Rapid Motor Vehicle Co., another General Motors subsidiary which has been discontinued.

The General Motors Truck Co. was formerly capitalized at \$10,000, all of the stock being owned by the parent concern.

WASHINGTON, D. C., March 8—The Prest-O-Lite Company has filed a suit in the District Supreme Court for an injunction to prevent the alleged infringement of its trademark by the National Electrical Supply Company. It is alleged that the defendant has attempted to refill the interchangeable cylinders of the plaintiff when they have been offered for exchange. The claim is made by the Prest-O-Lite Company that the good will of its business and trademark are worth \$7,000,000.



Market Changes of the Week

Few changes took place in last week's markets. Tin proved to be the most important, experiencing a drop of \$1.85 per 100 pounds. But more interest was shown in tin in the domestic market yesterday both in nearby and future positions. Lead dropped to \$4.20 per 100 pounds, a loss of \$.10. Electrolytic copper dropped \$.00 1-8 per pound. Antimony slumped to \$.07 5-8 a loss of \$.00 5-8. Both Bessemer and open-hearth steels remained constant at \$29.00 per ton. Cottonseed oil fluctuated throughout the week, its highest mark being \$6.38 per barrel, and its lowest \$6.37, a loss of \$.01. Domestic scrap rubber remained in a very steady position. Collections are still reported to be unusually light and stocks continue small. Dealers report a moderate movement into consuming channels at home and abroad. No new features developed in the export branch of the market for refined petroleum yesterday. The prices of Kansas and Pennsylvania petroleum, per barrel, were \$.88 and \$2.50 respectively.

Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's
Antimony, per lb.	.08%	.07%	.07%	.07%	.07%	.07%	— .00%
Beams & Channels, per 100 lbs.	1.61	1.61	1.61	1.61	1.61	1.61	.....
Bessemer Steel, ton	29.00	29.00	29.00	29.00	29.00	29.00	.....
Copper, Elec., lb.	.14%	.14%	.14%	.14%	.14%	.14%	— .00%
Copper, Lake, lb.	.14%	.14%	.14%	.14%	.14%	.14%	.....
Cottonseed Oil, bbl.	6.38	6.38	6.38	6.38	6.40	6.37	— .01
Cyanide Potash, lb.	.19	.19	.19	.19	.19	.19	.....
Fish Oil, Menhaden, Brown	.33	.33	.33	.33	.33	.33	.....
Gasoline, Auto, 200 gals.	.22%	.22%	.22%	.22%	.22%	.22%	.....
Lard Oil, prime	.90	.90	.90	.90	.90	.90	.....
Lead, 100 lb.	4.30	4.35	4.20	4.35	4.20	4.20	— .10
Linseed Oil	.47	.47	.47	.47	.47	.47	.....
Open-Hearth Steel, ton	29.00	29.00	29.00	29.00	29.00	29.00	.....
Petroleum, bbl.	.88	.88	.88	.88	.88	.88	.....
Petroleum, bbl., Pa., crude	2.50	2.50	2.50	2.50	2.50	2.50	.....
Rapeseed Oil, refined	.68	.68	.68	.68	.68	.68	.....
Silk, raw Italy	4.30	.....	.....	4.30	4.35	4.35	+ .05
Silk, raw Japan	3.72%	.....	.....	3.72%	3.75	3.75	+ .02%
Sulphuric Acid, 60 Beaumé	.90	.90	.90	.90	.90	.90	.....
Tin, 100 lb.	48.35	47.75	47.25	47.25	46.50	46.50	— 1.85
Tire Scrap	.09%	.09%	.09%	.09%	.09%	.09%	.....

N. A. A. M. in Conclave

Decides Not To Have Separate Building at Panama-Pacific Exhibition—Trade People Apathetic

Recommends Abandonment of Truck Shows Week Following Passenger Car Show in New York and Chicago

NEW YORK CITY, March 7—At a meeting of the National Association of Automobile Manufacturers, March 5, it was announced that the proposal of having a separate building at the Panama-Pacific Exhibition to house the automobile exhibits has been dropped, owing to the inadequate response of the trade. Instead it was decided to accept the offer, on the part of the exhibition authorities, of 60,000 square feet in the transportation building. The feeling was general that this space would be found insufficient, but having regard to the attitude of the trade no other course could be taken.

The proposed consolidation of the N. A. A. M. was also touched upon, and a committee meeting will be held March 19, presumably to make final arrangements for the union. The incorporation of the new organization will probably take place before the end of the month. It will be styled the Automobile Chamber of Commerce, and the present officers of both existing bodies retained.

The ocean-to-ocean stone highway, to which a great deal of attention is being devoted at present, was considered by the good roads committee, which reported its approval.

Charles Thaddeus Terry, counsel for the N. A. A. M., was authorized to take action to protect the interests of the industry where adversely affected by the pending legislation in this state and Massachusetts.

It was unanimously recommended by the members present that commercial vehicle shows at New York and Chicago, which have been held on the week following the passenger car shows, be not held in 1914, such action being due to poor attendance during the recent shows and not doing the anticipated volume of business. This action, however, is not final, but in the form of a recommendation to the executive committee. The matter will next go before the consideration of the commercial vehicle committee which will meet in the course of a few weeks and hand its recommendations to the executive committee which may act on the matter at its meeting April 2. It is imperative that the subject be settled in the course of a few weeks.

January Exports Were \$2,668,013

WASHINGTON, D. C., March 11—(Special Telegram)—The exports of automobiles and parts from the United States for January, 1913, are as follows: Total, \$2,668,013; increase over January, 1912, of \$240,122. The total for the 7 months ending January, 1913 is \$14,761,139, being an increase over same period 1 year before of \$2,890,946. In January last, eighty-seven commercial cars having a value of \$182,271 and 2,070 passenger cars totaling in value \$2,051,806 were exported from this country. Engines and tires not included in "parts of."

Imports were as follows: During January, 1913, automobiles and parts of the total value of \$212,377 were bought from foreign countries, making a decrease of \$11,965. For the 7 months ending January last, the decrease was \$174,884.

DETROIT, MICH., March 10—The Studebaker Corp. of America announces the appointment of E. R. Benson as vice-president, which position he will fill in addition to retaining the sales managership. This move enables Mr. Benson to sign any legal papers incident to his sales work.

Many Car Sales At Boston Exhibition

Denver Dealers Enthused Over Advertising Value of Show— 40,000 Saw Des Moines Show

Attendance and Sales Gratifying at Louisville,
Pittsburgh and St. Louis—S. A. E. Studies Rims

BOSTON, MASS., March 11—(*Special Telegram*)—The indications for 1913, judging by the business of the Boston show, will be much better than the preceding year according to the men who have been identified with the Boston show. They base this on the general increased interest in the show this year. To test the matter some of the leaders and leading dealers did not put in any chassis this year in order that the crowds that hang about them might not interfere with prospective customers. These dealers say that it was a good move, for their spaces were crowded as usual, but by a lot of people who were real buyers and to whom a chassis display was not a novelty.

Then there were a great many more dealers from New England at the show. Manager Chester I. Campbell said that last year a little more than 3,000 men identified with the industry were registered. With the show but 2 days old this number had been increased by nearly 300, and many outside dealers do not register until the middle of the week to stay to the finish, so many more are coming.

Denver Show Good Advertising

DENVER, COLO., March 7—Denver dealers in automobiles and accessories are unanimous in declaring the outlook highly favorable for a heavy trade in their line this coming season, and their prediction is strengthened by the business indications developing at the twelfth annual automobile show now in progress at the Auditorium. The event will last one more day, and it promises to prove profitable to all participating.

DES MOINES, IA., March 8—Forty thousand people saw the fourth annual show of the Des Moines Automobile Association, which closed at the Coliseum tonight. Sixty different makes of cars were shown with a total of 200 models. A consensus of opinion among the dealers was that not less than 20,000 cars would be sold in the state this season.

BRIDGEPORT, CONN., March 10—The largest automobile show in the history of Bridgeport came to a close Saturday night at the Park City Rink. During the entire week the building was filled with automobile owners, prospective buyers and sightseers and the paid admissions numbered 7,500.

ST. LOUIS, MO., March 11—The Eighth Annual St. Louis Spring Automobile Show which was held in this city the week of February 24, was one of the most successful from a business standpoint ever held indoors in this city.

PITTSBURGH, PA., March 10—The third annual automobile and truck show held by the Pittsburgh Automobile Association in Exposition Hall was entirely the most successful exhibit of its kind ever seen in Pittsburgh. The attendance the first day was about 15,000, which was a gain of nearly 80 per cent.

LOUISVILLE, KY., March 8—After having held attention since Wednesday evening, in the First Regiment Armory, which covers

54,000 square feet of floor space, what is believed to be the best business show ever held south of the Ohio River closed tonight. Many car sales were reported and attendance was good.

Rims Occupy S. A. E. at Cleveland

CLEVELAND, O., March 12—*Special Telegram*—Following the regular March meeting of the Council of Society of Automobile Engineers, which was held at the Chamber of Commerce here this morning, at which meeting, in addition to the regular routine business, it was decided to appoint a fuel committee to co-operate with the recently-formed similar committee of the National Association of Automobile Manufacturers, the hearing before the pneumatic rim standardization division of the society was opened.

About thirty-five engineers and representatives of the rim makers were in attendance, while, in addition to the members of the council, the Rim Committee, consisting of Henry Souther, chairman; G. G. Behn, Hudson Motor Car Co.; T. W. Guthrie, Standard Welding Co.; F. H. Moyer, Firestone Tire and Rubber Co.; W. C. State, Goodyear Tire & Rubber Co.; C. B. Whittlesey, Hartford Rubber Works; C. B. Williams, Mott Wheel Works, were present. J. G. Vincent, Packard, and H. L. Barton, General Motors, were unable to attend.

There have been a number of letters of protest received by the society as to its appointing interested men on its committee, but it was shown to be desirable to have these experts so that their testimony might be used to the committee's advantage. The number of rim makers on the committee, however, is in the minority.

To facilitate the work of uniformly recording the testimony of the various makers, the committee prepared previous to the meeting a list of the points considered vital to the investigation, and the witnesses were examined along these lines. The committee has recognized the work of the Clincher Rim Association as applied to the one-piece type. It was made clear that while standardization was sought progress would not be checked, in that anything fixed by the division would be done so with the idea of later changing the standards providing such changes were made.

The investigation was opened by the taking of testimony of representatives showing quick detachable rims as distinguished from the demountable types. There were four samples of strictly detachable rims. Each representative was questioned as to the weight of his type, whether it could be sold in competition, how it withstood service, method of operation, number of loose parts, its adaptability to wire wheels, whether the standard dimensions of the Clincher Tire Association had been adhered to and whether it could be manufactured by any mill without special machinery. Other special questions were put in order to bring out as far as possible every feature of every type exhibited.

At the morning session three rim representatives were quizzed, these being W. L. Burgess, Firestone; O. W. Mott, Mott Wheel Works, and E. R. Hall, Goodyear. It is probable that the inquiry will extend over several days.

Proposes Regulation of Tire Width

NEW YORK CITY, March 10.—George McAneny, president of the Borough of Manhattan, had an ordinance introduced today in the City of New York, which is intended to regulate the width of vehicle tires and the loads carried thereon as well as the body width of vehicles. Objection has been raised to the excessive width of some automobile truck bodies because they practically limit the right of way to one direction along certain narrow streets. The ordinance proposes a standard maximum body width of 6 feet 6 inches and to tax all additional widths as follows: 6 feet 6 inches to 7 feet, \$5.00 per inch additional; 7 feet to 7 feet 6 inches, \$10.00 for each inch in excess of standard; 7 feet 6 inches to 8 feet, \$15.00 per inch in excess of standard; 8 feet to 8 feet 6 inches, \$20.00 per inch in excess of standard, and 8 feet 6 inches to 9 feet 6 inches, \$25.00 per inch in excess of standard. The regulations covering permissible weight on a wheel arrangements for annual licenses ranging between \$1.00 and \$1,000 per year, according to excess load per vehicle. Where loads are greater than 10,000 per wheel the additional tax is \$500 for each 1,000 pounds increase per wheel or fraction thereon.

Parcels Post Needs 100 More Automobiles

**Trucks of Various Makes with
Complete Equipment Ordered To
Be Bought by Postmaster-General**

**Hupp's Company to Be Tribune Motor Co.—Crop Report
Favorable—Western Insurance Underwriters Organize**

WASHINGTON, D. C., March 6—One of the last official acts of Postmaster-General Frank H. Hitchcock, before he was succeeded by Albert Burleson, was to sign the recommendations made by the committee of award for the awarding of contracts for furnishing 100 motor vehicles for the parcels post service, as they may be ordered during the fiscal year ending June 30, 1913. These vehicles will be distributed throughout the country. The contracts were awarded as follows:

The White Co., New York, five White cars, 1,500 pounds, \$2,000 each; Stewart Motor Corp., Buffalo, ten Stewarts, model F, 1,500 pounds, \$1,440 each; Kissel Motor Car Co., Washington, ten Kissel Kars, 1,500 pounds, \$1,350 each; Durant-Dort Carriage Co., Flint, Mich., ten model C, 1,600 pounds, \$1,225 each; Louis J. Bergdoll Motor Co., Philadelphia, ten Bergdoll 30 delivery cars, 1,500 pounds, \$1,240 each; Atterbury Motor Car Co., Buffalo, ten model A, 1,500 pounds, \$1,323 each; the Willys-Overland Co., Toledo, ten model 69 delivery special, 900 pounds, \$1,000 each; Studebaker Corp. of America, Detroit, five model 20 delivery wagons, 750 to 1,000 pounds, \$755; Prest-O-Lite tank, \$25 extra; C. B. B. Motor Car Co., Washington, ten Modern model B, 1,000 pounds, \$1,270 each; Waverley Co., Indianapolis, five machines, 1,000 pounds, \$1,739 each; Kentucky Wagon Mfg. Co., Louisville, five model 10 Urban, 1,000 pounds, \$1,793 each; Ward Motor Vehicle Co., New York, five commercial type EA, 1,000 pounds, \$1,975 each; Baker Motor Vehicle Co., Cleveland, five model H, 1,000 pounds, \$2,000 each.

Each car is to be equipped with the usual accessories, including windshields, lamps, horns, storm curtains, tools, etc.

To Sell Matheson Plant

WILKES-BARRE, PA., March 10—William C. Shepherd, receiver of the Matheson Automobile Co., has been directed to sell at public auction the right, title and interest, etc., of the company on April 21, at 10 a. m. The property will be offered for sale in separate parcels, most of which is subjected to mortgages. It includes real estate, buildings and equipments on which there is a first mortgage of \$200,000 of which there are outstanding \$183,200 bonds carrying interest amounting to \$4,268.56. There is a second mortgage of \$105,000 of which there are outstanding bonds \$68,500 together with interest. The total of mortgage bonds with interest on April 21, 1913, will amount to \$257,222.11. Bids must be accompanied by a certified check or 10 per cent. of the total amount.

Nearly 200 Inquiries on Thomas Sale

BUFFALO, N. Y., March 12—(Special Telegram)—The entire plant of the E. R. Thomas Motor Car Co. is to be sold at public auction beginning Monday morning, March 17 at the plant on Niagara street. There are 5,843 catalogue lots in this sale and it will require about 6 full days to complete the auction. J. E. Conant & Co., auctioneers, of Lowell, Mass., will conduct the sale. As a result of advertising about ten inquiries have been received from Europe while those from the United States and Canada total 180 in 30 days. Articles to be sold include modern high-speed automatic and other machine tools with machinery and mechanical equipment. The Thomas sale will be one of the biggest auctions ever conducted in North America.

Hupp's Firm Is Tribune Motor Co.

DETROIT, MICH., March 10—It has developed that L. G. Hupp, formerly of the R-C-H Corp., and his associates cannot make use of the name Monarch Motor Car Co. for the new automobile

concern which they have launched recently. Two applications for this title were filed at Lansing at about the same time, that of Mr. Hupp being superseded by a few hours by an application fathered by A. J. Bloom, F. J. Priest and E. L. Wallace, who have incorporated with a capital of \$30,000 to manufacture motor cars. Consequently, Mr. Hupp had to decide on another name for his company, and he selected that of Tribune Motor Co. A low-priced car is to be manufactured in a factory on Scotten avenue. Mr. Hupp will head the company, while H. C. Limbach is to be chief engineer.

WASHINGTON, D. C., March 11—(Special Telegram)—The governmental crop report of March 1 shows percentages of wheat, corn, oats and barley on farms on March 1, 1913, to be considerably in excess of amounts on farms on March 1, 1912, with present conditions in the West, Northwest and Southwest as to all these crops unusually favorable, the crops on farms being greatly in excess last year.

INDIANAPOLIS, IND., March 10—A company to hold the patents of Thomas J. Lindsay has been organized in this city under the name of the Lindsay Automobile Parts Company, which has been incorporated with an authorized capitalization of \$250,000. Mr. Lindsay is the inventor of many devices and automobile parts, including the Lindsay roller bearing axle. The company will hold these patents and control the licenses granted other companies for manufacturing purposes.

The officers and directors are: Mahlon E. Bash, president; Joseph T. Head, vice-president and Matt W. Lowder, secretary-treasurer. Mr. Bash and Mr. Lowder are officers in the Lowder Manufacturing Company, manufacturers of automatic timing devices.

Stromberg, Accessory Pioneer, Dies

CHICAGO, March 10—Alfred Stromberg, former president of the Stromberg Motor Devices Co., died Saturday noon at his home in this city of apoplexy. He had been ill 3 weeks. He was born near Stockholm, Sweden, March 9, 1861, and lived to be 1 day less than 52 years old. He learned the telephone business in Sweden, coming to Chicago in 1883, where he identified himself with the Chicago Telephone Co.

BATTLE CREEK, MICH., March 8—The annual meeting of the stockholders of the Castle Lamp Company, the factory of which is at Battle Creek, Mich., was held in Toledo on February 28, and practically all the stockholders were represented.

The directors elected by the stockholders were: E. A. Williams, Jr., Walter Stewart, Royal R. Scott, Rathbun Fuller and C. B. Mertz. These met afterwards and elected E. A. Williams, Jr., president; Walter Stewart, vice-president and treasurer and Royal R. Scott, chairman of the Board and secretary.

Western Underwriters Organize

CHICAGO, March 11—Lower rates of insurance on new models and higher rates on second-hand cars will result from the formation of the Western Automobile Underwriters' Association in this city recently and an alliance with the Automobile Underwriters Conference, the parent body, to be effected soon. With the new organization established as a subsidiary body to the conference, the Eastern schedule of rates will be adopted.

The schedule of rates now in force in Chicago and the Middle West do not differentiate between the new and the second-hand machine. For example, the owner of a 1913 model, listed at \$3,000, who wishes to insure against fire and theft for \$2,500, must pay a rate of 2.5 per cent. or an annual premium of \$62.50. The owner of a second-hand car, put on the market 2 years ago and selling then for \$3,000, wishing to insure for \$2,500, pays a rate of 3 per cent. on \$1,500, 40 per cent. being deducted from the desired amount of insurance for depreciation, or a yearly premium of \$45.

Digest of the Leading Foreign Journals

Great Success Reported for Dr. Low's Motor with Fuel Injected by Tension of Its Own Vapor—Clutch Design and Other Features in Two French Cars—Steering Gear Which Takes Up Play Automatically

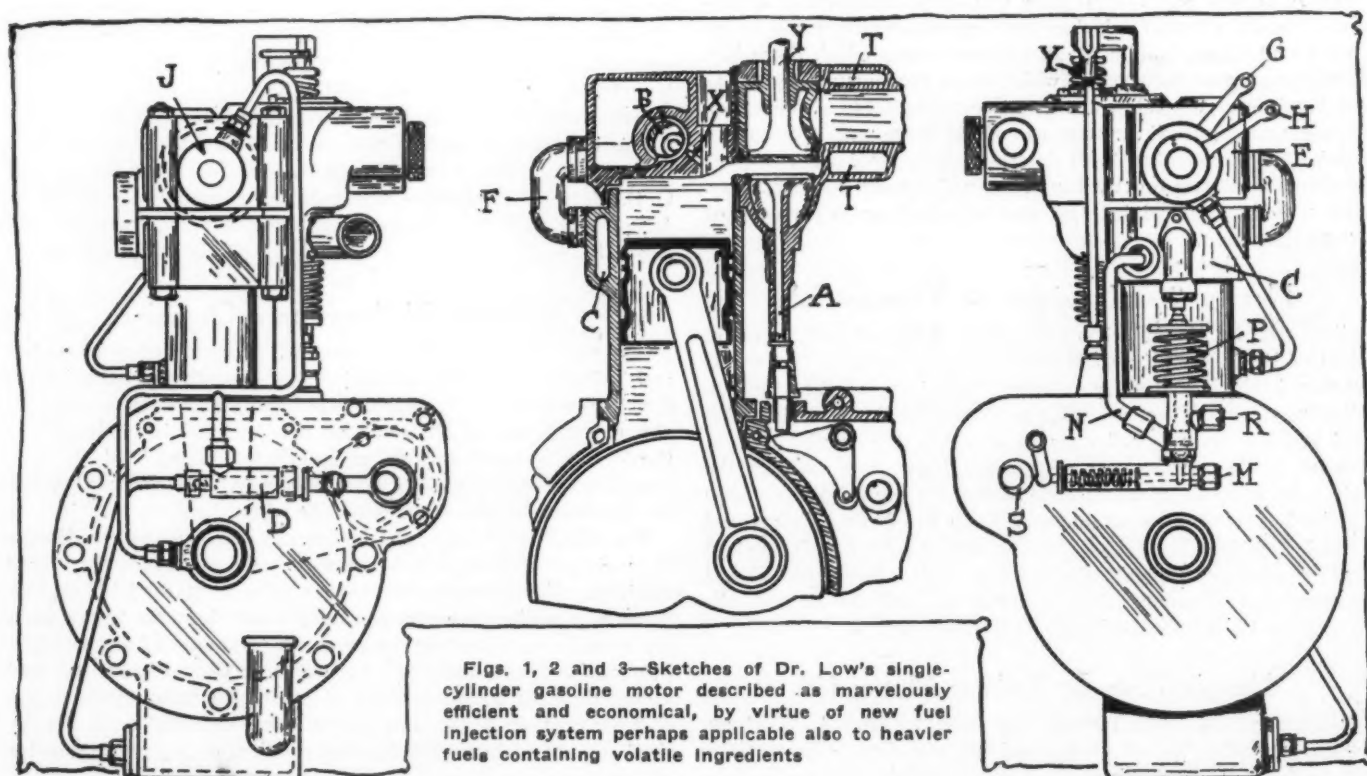
DR. LOW'S Gasoline Motors à la Diesel—All developments tending toward the adaptation of the Diesel motor principle to small high-speed motors which may be employed for automobile purposes are now being sedulously watched by automobile research engineers in Europe, under the influence of the unrest in the fuel situation and perhaps also by reason of a growing conviction to the effect that—with the information and mechanical resources of the present day and with the example of non-poppet valve motors at hand—the time has come for varying the standard design of automobile motors in accordance with those theoretical possibilities which have always been widely recognized as existing.

The features in the Diesel motor which fascinate are (1) the gradual combustion of the fuel, giving a sustained piston pressure, reduced vibration and improved thermal, as well as mechanical, efficiency, (2) the injection of the fuel at the end instead of the beginning of the compression stroke, making high compression admissible, as there can be no premature ignition and (3) the option of several cheap fuels which the system renders available in the Diesel motors of relatively low speed and which, it is hoped, may be used also to some extent in the small high-speed motors which are the subject of the development. The independence of electric ignition is now scarcely considered so important as it formerly was, although, if magnetos may be

dispensed with, the resulting reduction of first cost is in line with the object in view.

As an actual achievement in this direction which is looked upon as most significant, the small motor developed by Dr. Low in England after many years of experiments has attracted attention. It was exhibited at the last Olympia motorcycle show and may be considered as a sequel to a two-cylinder, four-cycle motor which Dr. Low placed before the public a year earlier, after he had abandoned previous efforts at perfecting a two-cycle motor based on similar principles. High temperatures were then found too troublesome with the two-cycle system, but it is now reported to be the inventor's opinion that his latest type could be built as a two-cycle motor without encountering serious difficulties. The London correspondent writes about the latest type in substance as follows:

The new Low motor involves no absolutely new methods, and this is considered a very reassuring characteristic, disposing largely of doubts as to its reliability in continued service. It depends largely on a high compression of air in the cylinder and forced injection of fuel under pressure created by the tension of its own vapor in a chamber containing no air. The regulation of quantity in the fuel admission was originally the greatest difficulty with which the designer had to contend, and in his two-cylinder, four-cycle motor it made itself felt



Figs. 1, 2 and 3—Sketches of Dr. Low's single-cylinder gasoline motor described as marvelously efficient and economical, by virtue of new fuel injection system perhaps applicable also to heavier fuels containing volatile ingredients

in the operation, while troubles relating to overheated valves were met by resorting to exhaust ports in the cylinder walls. Nevertheless, this earlier motor developed, when in order, 18 horsepowers with a cylinder volume of 400 cubic centimeters.

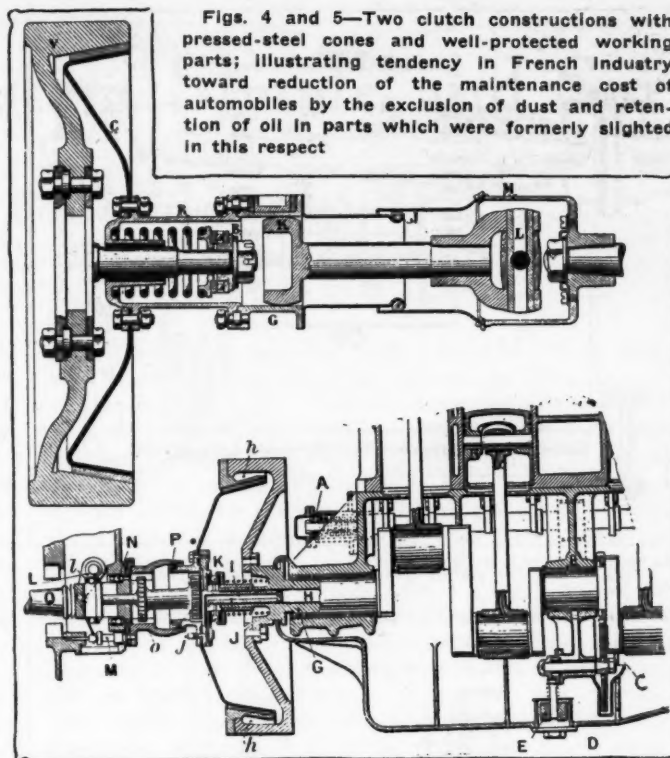
The new single-cylinder motor has a bore of 78 millimeters and a 104 millimeter stroke, making a piston displacement of 499 cubic centimeters, and it develops 15 horsepowers with a working pressure of about 30 atmospheres. Figs. 1, 2 and 3 show different views of the construction.

The eccentric-driven oil pump D, Fig. 1, drives the lubricant to the principal bearings as well as to the cylinder walls and the rotary fuel valve, through the pipes shown in this view, and the shaft of the eccentric—itsself driven by chain from the motor shaft—runs across the crankcase to the opposite side where it drives the gasoline pump M, Fig. 3, by means of cam S, thereby forcing the gasoline from the main tank, which is connected at M, through pipe N into the chamber C, Figs. 2 and 3, which partially surrounds the cylinder. As shown in Fig. 3, the fuel pump and the fuel chamber C are connected by a relief valve. So long as no excessive pressure is produced in the chamber, the pumping pressure and the spring P hold this valve [apparently a needle valve] closed, but when the pressure passes beyond that determined by spring P, which is adjustable, the surplus gasoline flows back to the main tank by way of a pipe connection at R. By these means the fuel is kept under a uniform pressure of about 90 atmospheres [more than 1300 pounds per square inch]. If the pressure sinks much below this standard, the gasoline [vapor] is likely to condense when passing to the rotary fuel admission valve through transfer pipe F.

The exhaust valve Y, Fig. 2, works in the usual manner of exhaust valves and is cooled, as at T, from the water jacket E, which also surrounds the fuel valve B. This valve consists in a 10-centimeter long cylinder journaled in a bronze bushing and is driven by a chain from the motor shaft [though it is somewhat against approved practice to drive by chain from one shaft to another vertically above it]. The bushing is provided with grooves which hold lubricating oil and receive possible carbon precipitations from the fuel. The valve cylinder comprises two sleeves. The outer one of these is finely threaded, so that it can be screwed in and out and can be nicely adjusted by means of the lever G, while the other may be turned freely by means of the lever H, so as to bring a slot in it to register, at different periods, with a slot in the valve piston. A triangular aperture in the inner sleeve admits of regulating the quantity of the fuel feed.

For high speeds the valve is so regulated that the fuel enters the cylinder very rapidly and is fired a little before the motor piston is at high center; and for slow work of the motor about the same quantity of fuel is admitted, but is injected more slowly, giving a more gradual combustion. [The correspondent unfortunately does not make the mechanical provisions to this effect clear by means of an illustration of the rotary valve—the most important feature in the construction. In fact, only the accepted statement that the Low motor has been tried in practice and found to give extraordinary power and service must account for the presentation of a description which is fragmentary and unsatisfying on nearly all points of real technical interest.—Ed.] The adjustment of the fuel quantity lends the motor the flexibility of a steam engine, rendering it possible, when the motor is applied to a vehicle, to climb grades without raising the motor speed; merely by increasing the charges. [And it may be presumed, it seems, that the air required for the combustion of the large charges is reduced to the theoretical minimum by reason of the very high compression employed, while in the ordinary automobile motor the amount of air required for effecting a perfect combustion is practically twice as large.—Ed.]

The motor can be started either by injecting gasoline in the rotary valve or by increasing the compression in the fuel chamber C by heating it from the outside. In addition there is provided means for obtaining a one-fourth compression by cranking the motor and in this manner obtaining a normal ignition.

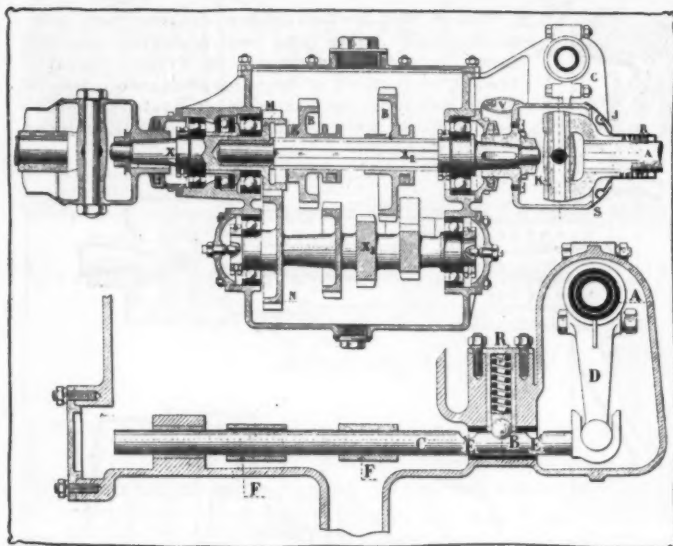


Figs. 4 and 5—Two clutch constructions with pressed-steel cones and well-protected working parts; illustrating tendency in French industry toward reduction of the maintenance cost of automobiles by the exclusion of dust and retention of oil in parts which were formerly slighted in this respect

As soon as the motor gets warm, the pressure in the fuel chamber rises rapidly, and as soon as it has reached 60 atmospheres, the piston works with normal pressure and sucks in the necessary air through the inlet valve A. At the moment of intended ignition the fuel vapor is admitted through the rotary fuel valve to the cylinder and when passing by the spark plug X is ignited. The regulation of the air and fuel feed is combined in one lever movement.

The inventor is now working on the perfecting of a four-cylinder motor operating on the same general principles that are employed in the single-cylinder motor, and he has already accomplished astonishing results with an experimental motor of the four-cylinder type. For example, he reached a speed of 166 kilometers per hour on the Brooklands track with this motor mounted on a Bianchi chassis, and used only 4.5 liters of gasoline for running 70 kilometers. With the same motor he registered 100 horsepowers by brake test by driving the speed up to 3000 revolutions per minute, although the motor's normal rating is only 16 horsepowers according to its dimensions.—From *Auto-Technik*, February 14.

SHEET Steel Cone Clutches and Other Features in French Cars.—In Figs. 4 and 5 two instances of 1913 construction are illustrated in which, among other features, cone clutches pressed from sheet steel are used. Fig. 4 represents the clutch mechanism in a 10-12 horsepower Sizaire-Naudin car. The pressed-steel cone C is light and somewhat flexible, the lightness being always desirable in a clutch and the flexibility being now claimed as an advantage for softening the start in the case of a car of small weight and power. It is connected with the gearbox by two universals, of which the front one, K, is of the "rounded-square" type and the rear one, L, of the crossed-spindle type, and both are enclosed in a metallic sheath formed in two parts capable of telescoping and bending at the joint J while remaining dust-tight and oil-retaining. In the act of unclutching, the cone is drawn back by a fork which is lined with fibre and engages the groove G which is formed upon the outer member of the front universal, and the fibre lining, by its close fit on G, acts as a brake, reducing the momentum of the transmission elements, so as to facilitate gear-changing. In order to get at the clutch spring—to readjust it, if needs be—it is only necessary to unbolt the



Figs. 6 and 7—Change-gear system in Sizaire-Naudin car

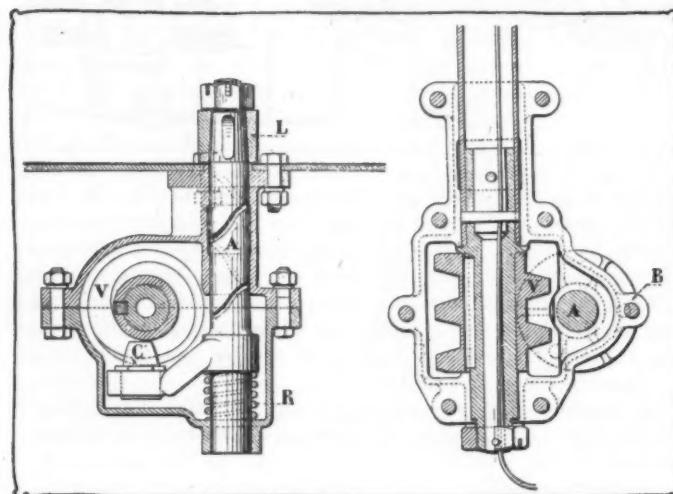


Fig. 8—Self-adjusting steering gear for small car

part G and push back the front part of the sheath. Then the adjustment nut can be reached with a spanner. If the cone is to be dismounted, the front end of the short shaft connecting the universals is allowed to drop, and then the spring-adjustment nut, the ball-bearing abutment B and the spring can be removed, whereafter the cone can be withdrawn.

Fig. 5 gives a view of the clutch mechanism and a part of the motor in a 25-horsepower Rochet-Schneider car.

The construction of the clutch proper, as shown, also applies to the 12-horsepower model of the same make, in which, however, the universal joint is omitted, as the motor, the clutch and change-gear box are supported on a single aluminum casing, differing from ordinary unit construction in this that the casing is open at the top between the motor and the gear box cover, so as to leave the clutch as accessible as if the parts were separately mounted.

The clutch-operating parts in the 25-horsepower model are all inclosed, and the cone is of the inverted type with special provisions for preventing oil from straying onto the cone facing. To this end, the flywheel is made in two parts, the female cone being formed as a separate annular lip, and the annular space *h* between this lip and the flywheel rim receives all oil which may be thrown out centrifugally from the central parts. The latter are oiled from the bore H which constitutes an oil reserve in the end of the crankshaft. Every time the clutch is released, the clutch shaft which is aligned and supported in the bore H, acts as a piston, driving a small amount of oil back

through its own hollow center. The oil supply is renewed at the filler *j*.

The rest of the unique construction relating to the conservation of the clutch control mechanism may be understood from the drawing, in which Q is the primary shaft supported in ball-bearing N, L the clutch pedal shaft mounted in the gearbox, M the clutch brake, O the universal joint surrounded by a bell-shaped casing secured to the primary shaft at the rear and by a felt-lined joint P to the hub of the sheet-steel cone. K is the end-thrust ball-bearing of the clutch spring, and *l* that of the clutch pedal movement which is received through a sleeve mounted upon the primary shaft and abutting against an intermediate piece sliding in a slot in the shaft and in turn bearing against the universal. There is, by this construction, no break in the continuity of mechanism from the clutch cone to the gearbox and no chance for dust to enter or oil to escape—all of which relates to the reduction of maintenance cost.

The motor comprises a four-cylinder (110 bore by 140 stroke) block casting with very long bearings in which the oiling is safeguarded by a very powerful pump D, which filter E, driven from a spur gear mounted directly upon the crankshaft at one side of its middle bearing.—From *Omnia*, February 22, and *La Vie Automobile*, February 22.

FEATURES of 10-12 Horsepower Car.—In addition to the clutch of the small Sizaire-Naudin car mentioned in the preceding note, the change-gear and the steering-gear in the same model are also interesting. The gearbox is shown in Fig. 6 and the control and locking system in Fig. 7. The three front speeds and the reverse are controlled by two shifting forks which extend horizontally from the left side of the gearbox. The lever for operating them is of the type which is worked transversely. By placing the intermediate shaft *X*₂ below the primary shaft *X*₁ and the secondary shaft *X*₃, and keeping only the intermediate shaft submerged in oil, the level of the latter is kept far below the level of the sliding gears and the stuffing-boxes through which oil is likely to exude, with the result that the gathering of dust and oily grime is largely avoided.

All journals are ball-bearing, and the primary shaft has an abutment and an end-thrust ball-bearing between the two radial bearings, relieving the latter of those stresses which cause most wear. The control of the shifting-forks is completely inclosed in a small casing C attached at the front left of the gearbox. The locking device is inclosed in a separate portion, V, of this casing and can be inspected by removing two nuts from the cover of this portion.

Each of the two sliding gears is controlled by one of the forks FF, and each of these is mounted upon both of the selector-rods, which lie side by side, but is of course secured only to one of them, while the other in each case acts as a guide rod, passing through the boss of that fork which it does not control with an easy sliding-fit. Each of the rods can be engaged by the arm D, Fig. 7, which is fixed upon the shaft A of the operating-lever. Three notches E correspond to the three possible positions of each selector-rod, and a steel ball B is pressed into each notch by a strong spring R according to the position to be secured. A definite lever movement is required for dislodging the ball.

Steering of the Sizaire-Naudin car is especially hedged with precautions against wear and play, embodying devices for taking up all play automatically. A worm gear V with very coarse thread is secured upon the steering port, but does not engage a screw or sector. A conical finger C is secured to an arm mounted upon the shaft A of the steering-arm L and extends into the thread of the worm. Rotation of the latter naturally causes the finger C to move up or down and a corresponding movement of the steering-arm.

The shaft A is constantly pushed by the spring R, so that the tendency of the finger is always to seek the bottom of the thread. It is noticed that this spring action is at right angles to the steering effort and remains unaffected by shocks upon the front wheels.—From *La Vie Automobile*, February 22.

Packard Service System Simple and Sure

Boston Branch Uses, Besides Time and Labor Records, Scheme of Checking All Accessories

SERVICE department systems are used because of their manifold advantages. Firstly, they enable the manager of the department to ascertain the exact cost of every repair job and to charge the customer no more than necessary for first-class work, without taking a chance of conducting the department at a loss to the company. Secondly, they minimize waste or loss of labor and material, thus directly reducing the two principal cost items. Thirdly, they make it possible to keep exact records of accessories, parts and equipment of automobiles brought into the department to be repaired, and to avoid completely or almost so the loss of such articles, which, if it occurs, means a loss to the company of just as much money as the article cost.

In the long run, a record system has the additional advantages of permitting the establishment of standards of repair cost and of determining exactly the comparative efficiencies and consequent values of the various workers. All this information may be obtained in a very easy manner, that is, by the use of a small number of forms filled out to record every essential operation done in the department. In the course of time this system may

be more and more simplified, until it takes almost no work yet helps to keep efficiency at the top notch all the time.

As an example of an excellent scheme the service system of the Boston, Mass., branch of the Packard Motor Car Company, described below, is simple and has a number of strong points. One is the small number of forms used; another, that shop workers are hardly troubled at all with the record system, but that this work is done entirely by the office forces of the several departments; furthermore, there is provision for recording every essential detail, so that records form a good basis for correct minimum charges to the customer. These points hold good for all Packard service systems, the method being the same in all cases and the only difference lying in variation of details as carried out in the various plants.

The forms illustrated and described below are only the main five blanks. Outside of these, the Packard system includes the well-known time-clock card and a requisition form as well as a card-file form for the stock room. These, however, having been shown repeatedly with explanations of their use, in *THE AUTOMOBILE*, are not taken up in the following description. The forms

Form 21

PACKARD MOTOR CAR COMPANY OF BOSTON. Alvan T. Fuller, Prop.

Terms: **Cash** **Charge:** **No.**

Make.....Model.....Motor No.....Date.....191.....

Owner.....

Address.....

The following work is to be done:

When promised		Date from paint room	
Date from repair room		" " trimming room	
" " body "		" " finishing room	
" " testing "		" O. K'd	

The instructions hereon are correct.

Signed.....Per.....

Above order was received by.....Order Clerk.

Work Completed.....Inspected by.....

Delivered.....To.....

Signature

Fig. 1—Blank of job card used by Boston service department of the Packard Motor Car Co.

BODY EQUIPMENT						
OWNER	STOCK		DATE REC'D			
ADDRESS			DATE DELIV'D			
JOB NO.	BODY NO.		LOCKER NO.			
			TYPE			
WITH BODY Rear fenders " fender brackets Tonneau floor boards Folding seats Roof rail Door handles Door lever Gasoline tank Front cushion Rear " Dome light " " bulb Speaking tube Enunciator Foot rest Hat holder Door hooks Fore doors Paint body Monograms Top Envelop Top straps front " " rear Storm front Top supports " bow separators Tail lamp brackets Rumble seat IN LOCKER Tonneau mat Front floor boards Enclosed body keys Toilet cases " bottles " mirror " pad and pencil " match case " ash tray " card case " watch Silk window curtains Umbrella cups Enclosed body bolts Dress guards Seat covers Front outside side curtains Flower vase and holder BATTERY	IN	OUT	MISCELLANEOUS <div style="border: 1px solid black; padding: 10px; margin-top: 20px;"> <p style="text-align: center; font-size: small;">Fig. 2—Body equipment part checking card</p> <p>here shown and described, with an explanation of their purpose and use, are:</p> <ol style="list-style-type: none"> 1. The job card or order card. 2. The name and number tag. 3. The equipment checking blank. 4. The claim tag. 5. The body equipment blank. <p>Taking these forms up in the order of their numbers, the first to consider is:</p> <p>1. The Job Card or Order Card—This form is 7 by 12 inches, and is made out in the main office as soon as a car is brought in by its owner to be inspected or repaired. The form comes in pads of consecutive triplicate blanks, a yellow original, a white carbon duplicate and a third copy on thin tan cardboard. When the customer brings his car in, the order taken by the superintendent of the department is typewritten on the form, Fig. 1, noting, on the top of the page form, the model car and motor number of the machine, the date on which it is brought in, the name and address of the owner and the terms at which the work ordered is to be carried out. Then, the details of the work ordered are entered on the blank and when the latter is filled out completely in so far as the customer's wishes are concerned, the yellow copy remains in the superintendent's office, the white copy is sent to the coach department and the tan cardboard copy is attached to the car. It is carried in an envelope designed specially for this purpose, which is fastened to the steering wheel.</p> <p>2. The Name and Number Tag—Whatever transactions are carried out in the service department and which refer to a certain car, are recorded on blanks on which the job number and the name of the car owner appear. To insure this, the tag, Fig. 3, is filled out. As a matter of fact, about fifty or seventy-five such tags are made out, by means of a tag-printing machine, as soon as the motor car is received in the service department. A number of these tags are used for labeling the accessories which are taken off the car—which phase of the work is described further below—while the rest are put in the aforementioned envelope and carried on the car.</p> <p>3. The Equipment Checking Blank—Before the car is sent out of the shop, however, all accessories which are removable are taken off, recorded and numbered by means of tags, after which they are locked together in a special bin by themselves. This work is done most carefully and every part and accessory, whether part of the regular Packard equipment or not, is noted on the form, Fig. 4. This blank is 8.25 by 20 inches in size and printed black, being ruled red and blue. It is made out in duplicate with a carbon which is given to the owner as a receipt for the equipment. When the car comes out of the shop again, the clerks specially employed for this purpose go over it and check every single item on the record. If a part or accessory which was there when received is missing or damaged, the</p> </div>		IN	OUT

Reproduction of form in five-sixth of full size

OPERATION

EMP. No OWNER TYPE

D P H ARRIS TR

JOB No

21273 1348 35595

Fig. 3—Tag used for labeling accessories and noting parts needed

Packard company makes good for the loss incurred. While here only the front side of this blank is shown, it should be stated that the reverse is also printed, so as to permit recording the accessories and parts of top, body, lamps, horn, batteries, tires and whatever miscellaneous, special accessories are carried on the car.

4. The Claim Tag—This form, Fig. 5, is an original blank, especially introduced by the Packard company for the recording of accessories which are brought in by the owner of a car later than the car itself, but which he wants put on the car in connection with the work done in the shop. This form is 3 by 7.5 inches in size and printed on tan cardboard of the shape seen in the illustration. The lower portion of the blank forms a coupon which is torn off after the form is filled out and is given to the owner as a receipt for the accessory brought in. The claim tags are consecutively numbered.

5. The Body Equipment Blank—This form, Fig. 2, is 8.5 by 11.5 inches in size and is used, when repair work is done on the body or if the latter is painted, so that it must be taken down and all its parts be disassembled and stored by themselves. If this is needful, exact recording becomes necessary, as in the case of accessories, and the form used in this case serves exactly the same purpose, in its special field, as form, Fig. 4, for checking accessory and equipment of the car. A record is made of the parts which remain on the body and of those which are taken off it and placed in a locker to be reinstated and checked after the body is ready to leave the department.

Following is the method adopted for handling the forms by the clerical force.

1a. Use of Job Card—The blanks of this form, like all other forms, are stored in the stationary department, except for a relatively small number of pads stocked in the office of the superintendent of the service department. The blanks are filled out by an office clerk, and attached to the cars while a copy goes to the coach department, as already stated. The copy affixed to the car stays there, and after the repair work has been completed and every item checked by the workers who carried out the operations the shop foreman or a clerk of his enters the cost of labor and material used on the back of the card. The coach department copy remains with the foreman of that department and after the work is completed there it is returned to the main office. If the coach department has no work to do on the car, the copy is sent for by the superintendent's office, when the car is ready to be turned over to its owner.

2a. Use of Identification Tag—The tags are prepared in the main office and after part of them have been used by the accessory checking clerks, the remainder are placed in the same envelope with the job card. The workman operating on the car is not troubled with any detail work, but when requiring a part makes a note on a tag, the detail work of making out a requisition being taken care of by a clerk used to do this work. The stock records are of course also worked by clerks.

3a. Use of Equipment Blank—This blank is filled out simultaneously with the dismounting and tagging of the accessories, and by the same people. When the repairs are complete, the same clerks mount them on the car again and check them.

4a. Use of Claim Tag—All blank claim tags are stocked, with other blank printed matter, in the stationery department. When accessories are brought in and registered on them, this is done by the clerks checking off the accessories and parts.

5a. Use of Body Equipment Form—The majority of these forms is kept in the stationery room, but a number of them are held in the body shop and when it becomes necessary to overhaul a body a workman and a clerk of this department go to work on it, the one taking down whatever parts may be disassembled and the other recording them and putting them in a suitable storage place. When the work on the body is finished, the parts are put back in place and the form after having been checked is turned over to the superintendent's office.

[illegible]

Fig. 4—Accessories record


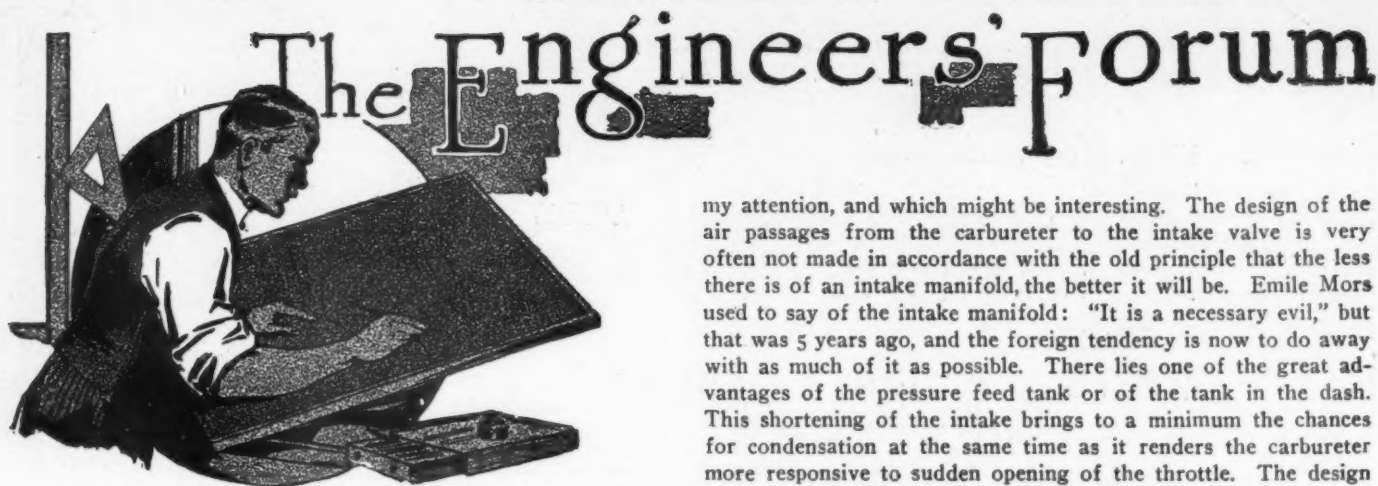
	
<h1>ALVAN T. FULLER</h1>	
1089 COMMONWEALTH AVE. BOSTON	
<h2>CLAIM TAG</h2>	
<h3>4128</h3>	Salesman _____
IMPORTANT	
PLEASE REMEMBER THE NUMBER OF THIS TICKET IT WILL SAVE YOU TIME WHEN CALLING FOR YOUR GOODS	
We are not responsible for damage to goods, left in our care due to fire, casualty, burglary, the elements, or causes beyond our control or not due to our neg- ligence.	
Not responsible for goods after thirty days.	
Date _____	Owner _____
When Wanted _____	Job Order _____
ARTICLES	
Received From _____	
Job Order _____	Owner _____
Sent to _____	When Wanted _____
ARTICLES	
Owner _____	

Fig. 5—Packard claim tag



Carbureter Manufacturers on Carburetion

Makers of the Zenith, New-Miller,
Newcomb, S. U. and Solex
Give Their Views

Ideas on the Subject Differ Widely But All Agree That
There Are Many Factors To Be Considered

*N. R. Heftly Finds That Results Depend on Practically Every Part of
the Car—L. H. Colvin Lays Stress on Machining—Holzer-Cabot Co. Fea-
tures Control—G. W. Skinner Gives Test Results*

AT the present time interest in the problems of fuel economy and carburetion is so widespread that THE AUTOMOBILE decided that it is time for the automobile public to hear from the carbureter manufacturers as well as from the engineers who have been giving expression to their views on this subject in The Engineers' Forum. Accordingly letters were sent to most of the leading carbureter makers in this country as well as to some in England and France. Some of the replies have arrived and are printed herewith.

The ideas of the carbureter manufacturers should be of great value in studying this fuel problem, especially as practically all of the makers are conducting research work and making experiments with a view to bringing about improvements in design and a consequent increase in carbureter efficiency.

Results Depend on Many Factors

DETROIT, MICH.—The subject of increasing the mileage per gallon of gasoline is really very large and should include not only our experience on our own carbureter, but also some remarks of a general character, as, indeed, the mileage obtained, not out of a carbureter, but out of a car, depends on everything from the shape of your body to the type of your tires and the condition of the road, including all the intermediate parts, such as carbureter and motor, ignition, transmission, brakes, bearings, and the skill and individuality of the driver. We have also failed to mention the muffler, which is very important.

We have always refrained from stating the guaranteed mileage per gallon with our carbureter. Our only claim is that, other conditions being equal, we will give either increased mileage or an increased pick up, or a higher speed, or a combination of all these advantages.

There are, however, several points which have lately come to

my attention, and which might be interesting. The design of the air passages from the carbureter to the intake valve is very often not made in accordance with the old principle that the less there is of an intake manifold, the better it will be. Emile Mors used to say of the intake manifold: "It is a necessary evil," but that was 5 years ago, and the foreign tendency is now to do away with as much of it as possible. There lies one of the great advantages of the pressure feed tank or of the tank in the dash. This shortening of the intake brings to a minimum the chances for condensation at the same time as it renders the carbureter more responsive to sudden opening of the throttle. The design of the valve pocket also has a great deal to do with the condensation, and there is more gasoline lost through the supplying of an over-rich mixture to overcome the condensation at low speed than one would imagine.

Then the driver should exercise proper judgment in driving and remember that every foot and pound of power wasted costs a few cents. When a bicycle rider approaches an obstruction he will slow down as soon as he sees the obstruction; the careless driver will keep on with his foot on the accelerator pedal until he comes near to it, and then applies the brake:—Cost, gasoline and rubber.

It must also be remembered that sudden acceleration as well as sudden braking is very wasteful.

These remarks do not apply to our carbureter any more than to any other carbureter. While we do not pretend that ours cannot be improved, we merely mean to say that the discrepancies in the results obtained from a standard carbureter show conclusively that the greatest work to be done towards economy is within the province of the motor designer and of the individual driver.—N. R. HEFTLY, The Zenith Carbureter Co.

Machining Is an Important Feature

INDIANAPOLIS, IND.—When the layman can realize that gasoline will find its way through almost microscopical crevices and that at no great distance in the future the price will be almost prohibitive, then, and not till then, will he appreciate some of the well-known facts that apply to the carbureter as well as any other part of his car.

There has never been a machine put on the market for producing and machining metal that will turn the work out automatically at a high rate of speed and hold all dimensions to a plus or minus of a half thousandth or less.

To make a carbureter that will be machined so that it is gasoline-tight, the dimensions must of necessity be held closer than the well-known term steam-tight.

Now, to illustrate: Notice the sectional cut-off of the New-Miller model A, shown in the illustration. The throttle, or butterfly valve, T, when closed is perfectly flat. You can realize the care necessary in machining this disk to bring it to correct dimensions and the care for making the under-cut in body. The exact dimension for the nozzle J over the needle is just three-tenths of a thousandth—no more, no less.

A clearance of one-thousandth on either side of the gas needle by actual test on a block will develop 2 to 6 horsepower.

Now, to secure economy in driving there are several things all must do and know.

FIRST—Gas mixture will burn at a certain speed. When the motor travels faster than the burning of the gas you have either reached your limit or you must lessen the quantity of gasoline, so that it will burn faster than the motor is traveling.

SECOND—The getaway, if quick, must be rich as the motor is not up to speed and can handle or burn the quantity.

THIRD—The intermediate speed or the average driving speed is the same as the "getaway" speed, as to throttle opening.

RESULT: If the driver insists upon a quick getaway with a rich mixture, immediately he is traveling at the average driving speed of 15 to 20 miles per hour he is wasting gas—not burned—of from three to four thousandths past his needle, or, in other words, from 2 to 6 horsepower of unconsumed gases.

The adjusting of our carbureter is most satisfactorily done by closing off the gas until the motor spits and then giving it one and one-half turns, or a lift of the needle equal to about three-thousandths. This is for proportions between speeds. Then in driving we always use the steering-post control. We cut the gas down until motor spits, reverse control and give one or two notches.

This control has command of all speeds and is on the gas only. The air is positive, is set, and mechanically operated. The driver has nothing to watch—he simply listens to the purr of the motor and can cut the quantity of gasoline fifty times a day as easily as opening and closing the throttle. There are no wearing parts—simply a clearance and as the parts controlling do not touch they remain perfect for years, accurately metering out a saving charge to the layman or the expert.

Where a person buys a carbureter that has been made by placing the joints to a surface grinder, by stamping a disk out of sheet metal for a throttle and leaning it against the wall of the body for a closed throttle, it is just as reasonable to expect a sieve to hold water as that carbureter to hold gas; and it is well to remember that the machining of the instrument, outside of design, makes for a very large percentage of the economy.—L. H. COLVIN, New-Miller Carbureter Co.

Controlling from the Steering Column

NEW YORK CITY.—To secure the greatest mileage per gallon of gasoline will frequently mean making sacrifices in other respects, such as running the motor very hot, thus increasing lubrication difficulties, and cutting down the maximum power, or heating the mixture, which will probably reduce the power and may interfere with the smooth running of the motor on account of the quicker burning of the charges.

The most practical way to economize fuel that we have tried is to place the lever controlling the load-carrying mixture in a convenient location, say, on the steering column, so that the proportion of fuel can readily be kept at the lowest possible limit for any given driving condition. This works out well with our system of fuel control which serves to uniformly increase or decrease the fuel proportion throughout the entire motor range, instead of the effect being concentrated at some particular throttle setting as is frequently the case.—THE HOLTZER-CAROT ELECTRIC CO.

Testing by Analysis of Exhaust Gas

NEW YORK CITY.—It is important in taking exhaust gas analysis that the samples of gas be taken under all circumstances. Owing to the peculiarities of the carbureter the combustion will be most complete in some particular set of circumstances. For instance, on a test of a certain small automobile it was found that it was possible to secure on the average about 22 miles to the gallon of gasoline on a level road running on high gear at an average speed of 18 miles per hour. Although it would seem that this mileage was very fair, it was found that the exhaust products were too rich in uncombined carbon in the form of CO. The same car was tested on Fort George Hill, New York City, and was able to attain 18 miles an hour on low gear up the steep gradient. The gasoline combustion was at the rate of 9 miles to the gallon, but the combustion was perfect. There was no free CO in the exhaust and the percentage of CO₂ was at a maximum. In order that a fair test for average performance be made it is necessary that both level and hilly country should be tried. Samples of gas should be taken with the motor running

idly, with the car driving the motor as when descending a hill, with the car accelerating and when running up hill, besides taking ordinary flat roads at medium speeds.

It would also seem to be essential that in comparing the results obtained in testing, the conditions under which the tests were made should be taken into consideration.

When the motor is driven by the car in descending a hill there is a marked tendency on the part of the carbureter in many instances to flood and to furnish an exceedingly rich mixture. This will be noted in the exhaust by the presence of a large percentage of CO as compared to that found in the exhaust under ordinary circumstances.—LOUIS VAN RENSELLAER.

Results of Some Bench Tests

LONDON, ENG.—It may interest you to know of the bench tests made by our BX carbureter. It has a 1.75-inch bore and was fitted to an engine 3.54 by 3.94, rated at 40 brake horsepower at 3,600 revolutions per minute, this being a standard engine manufactured by a well-known automobile firm in this country.

We find that from cars fitted with 3.15-inch bore engines we have obtained as much as 32 miles per gallon of gasoline.

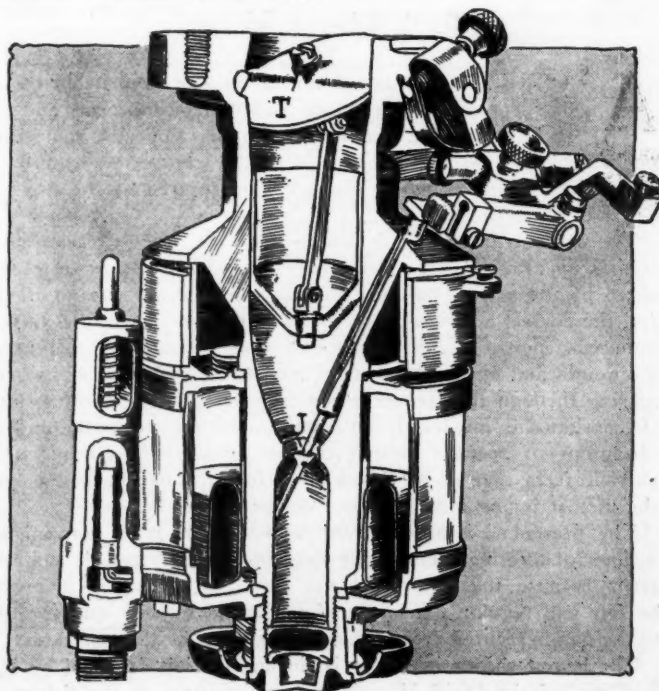
From a Chenard-Walcker car fitted with a 3.15 by 5.91 engine fully loaded with four passengers and being driven at an average of 25 miles per hour, 28 miles per gallon of gasoline has been obtained over give-and-take roads.

Standard 3.54-inch cars, which are used to a large degree in this country, weighing unladen from 30 hundredweight to 2 tons, will average 18 miles per gallon. Generally speaking, on passenger cars you can depend on getting 30 to 35 ton-miles per gallon.—G. W. SKINER, The S. U. Co., Ltd.

Trying Two Carbureters on Same Car

PARIS, FRANCE.—We find it difficult to give very precise data on the fuel consumption obtained with our apparatus. In fact, this varies within relatively wide limits according to the condition of the road, the nature of the carriage body, the manner of driving and the climatic conditions.

The only method which really means something consists in trying two different carbureters in the same vehicle under absolutely identical conditions, and it is only in this manner that the difference in consumption between two devices can be ascertained.—Goudard & MENNESSON.



Sectional cut-off of New-Miller carbureter, showing butterfly valve

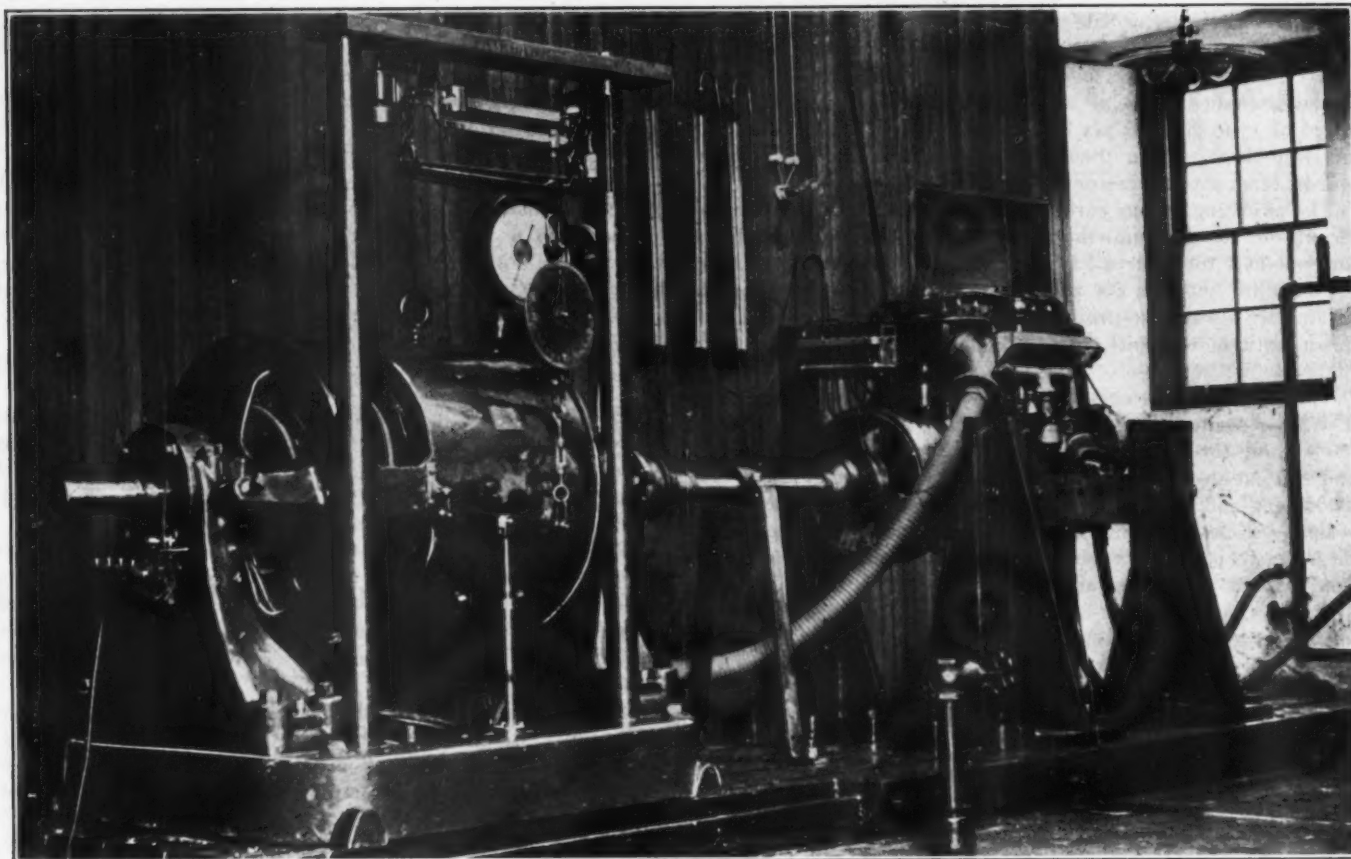


Fig. 1—Diehl electric absorption dynamometer connected to American motor at the Schoen-Jackson plant, Media, Pa.

Motor Testing Plants

Carbureter Manufacturers Alive to Necessity of Having Complete Apparatus for Accurate Testing Purposes

By J. Edward Schipper

A CORRECTLY designed carbureter can save its price in one season. It is a question of dollars and cents and as such strikes the automobilist in his tenderest spot—the pocketbook. It is the question that the carbureter manufacturers are trying to answer through data secured by the use of accurate testing plants.

Three main facts are determined by the use of carbureter testing apparatus. These are, the horsepower at any rotative speed of the motor, the fuel consumption per horsepower hour and the correct adjustment of the carbureter to attain the maximum efficiency at any given revolutions per minute. Besides these the weight and temperature of the cooling water before and after passing through the jackets is determined by sub-apparatus, the oil consumed is measured, the condition of the carbureter under conditions of speed variation can be found besides other important facts that go to make up a fund of data which is of the utmost importance in future design of the carbureter.

The presentation of them in curves is the most convenient manner of offering them and it also automatically guards against error because the nature of the curve is such that it must be fair and regular. It is therefore plotted so with due regard to the points secured from the readings given by the apparatus.

The layout shown in Fig. 1 is the installation designed by P. Dean, of the Diehl Manufacturing Company, at the Schoen-Jackson plant at Media, Pa. This laboratory in which the Feps

carbureters are tested may be taken as an example to show the process of making these tests.

The apparatus consists of three principal parts; namely: the dynamometer, fuel weighing device and control mechanism. Besides these there are the necessary tachometers, pressure meters, thermometers and clocks to take the readings of speed, pressure, temperature and time which are necessary to secure complete data of the action of the motor and the carbureter. They are laid out about the room to suit the convenience of the operator, but should be in such positions that they are accessible with a minimum amount of effort on the part of whoever manipulates the plant. Taking the Schoen-Jackson layout as typical of a modern installation a brief description may be valuable: Imagine a rectangular room approximately 20 feet in length and 35 feet in width, partitioned off from the end of a long oblong-shaped frame structure devoted to the manufacture of carbureters. The partition forms the dividing wall between the remainder of the factory and the testing laboratory. It is one of the 35-foot walls of the room. The wall opposite the partition is pierced by a large window which furnishes an abundant supply of daylight through its eastern exposure. This light is supplemented by two windows in the north wall and numerous skylights.

Along the west wall, formed by the partition, is the dynamometer and motor supports. This is shown in Fig. 1. Behind the motor may be seen the door which connects the testing plant to the rest of the factory. The north wall supports the water measuring and fuel measuring apparatus and along the east wall is arranged the control mechanism which is portable, however. The motor to be tested is brought in through a large double door which pierces the east wall at its juncture to the south wall. The space along the south wall is left free to bring in an entire car if desired. Overhead there is a traveler which is used for lifting the motor from the chassis and placing it in the testing frame. At the Schoen-Jackson place the dynamometer frame and the motor frame are both supported by one massive cast-iron T-slotted base plate, weighing 8,000 pounds, stiffened

on the under side by a number of parallel vertical ribs, cast in a concrete foundation anchored on bed rock, running longitudinally the length of the plate. The plate is stiff and free from diaphragmatic vibration. This plate is shown in Fig. 1, with the dynamometer and motor in place.

The dynamometer used on the Feps carbureters is of the direct-current Diehl electric absorption type. It consists of a steel frame fitted with commutating poles. The revolving armature is proportionately small in diameter to allow of high rotary speeds with comparatively small peripheral velocity. The steel frame is carried on two ball-bearing pedestals, one of which may be clearly seen at the near end of the dynamometer shown in Fig. 1. The pedestals are in turn carried on a heavy independent base plate. The ball bearings in this particular pedestal are of Hess-Bright manufacture and are practically frictionless, offering a negligible resistance to movement of the frame.

The armature shaft is extended and tapered to take a Spicer universal joint between it and the engine. A shield, carried by two stanchions, is placed around the Spicer universal shaft between the motor and the dynamometer to protect operators in case of fracture. The entire magnetic field frame rests in a ball-bearing cradle which offers no resistance to its free rotary movement.

Referring once more to Fig. 1, it will be seen that the motor drives the armature of the dynamometer by the universal shaft, or if desired, the engine may be driven by the dynamometer, when acting as a motor, through the same shaft. The motor can be started by means of an outside current which is allowed to flow through the windings converting the dynamometer into a motor. Owing to the magnetic drag between the fields and the armature, the entire field frame, swinging on the ball bearings, tends to rotate in the same direction as the armature, hence the torque. The torque varies with the magnetic drag. The magnetic drag is a direct result of varying currents in the field and armature, which currents may be controlled directly by the operator. The operator, therefore, has direct control of the torque and hence of the horsepower absorbed. Owing to the method of electrical connection the strength of the field current controls the load, therefore, the operator in controlling the torque need only manipulate the resistance in the field circuit. This is done at the master control table to be explained later.

Since the pull exerted by the armature is through a radius it will have to be reduced to horsepower by a formula in which cognizance is taken of this leverage. Matters can be simplified to a great degree if the radius is made 1.315 feet from the center of the shaft because the horsepower formula then becomes:

$$\text{Horsepower} = \frac{\text{Pull in pounds} \times \text{revolutions per minute}}{4,000}$$

From this formula a chart is made up showing the horsepower delivered by the motor at any given number of revolutions per minute. This chart is shown in Fig. 4. It is placed upon a board on the master control table, shown in Fig. 2. The radial lines represent revolutions per minute, fifty apart, starting with 50 on the left line.

In order that the readings may be exact, it will be noted in Fig. 1 that there are two scales. First, a spring scale which gives the rough readings and then the double beam suspension scales which are set for finer readings down to tenths of a pound. The insertion of the spring scale in the line aids greatly in the rapid shifting of the weights on the beam scales to the correct points and therefore helps in taking quick successive readings from the beam scales. It is

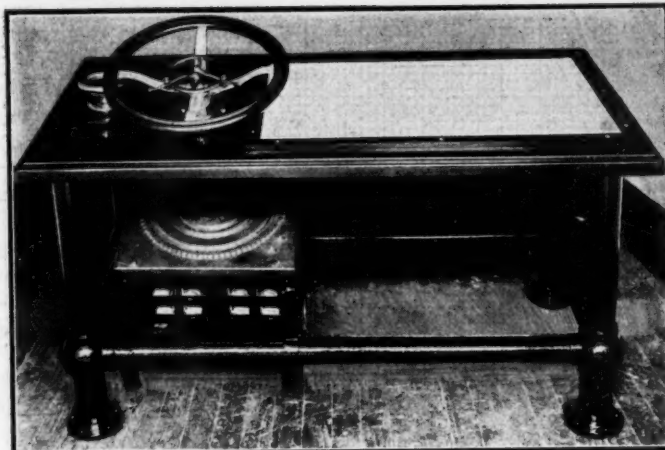


Fig. 2—Master control table, showing the steering wheel rheostat control which regulates the strength of the field circuit and the small wheel which controls the outside current

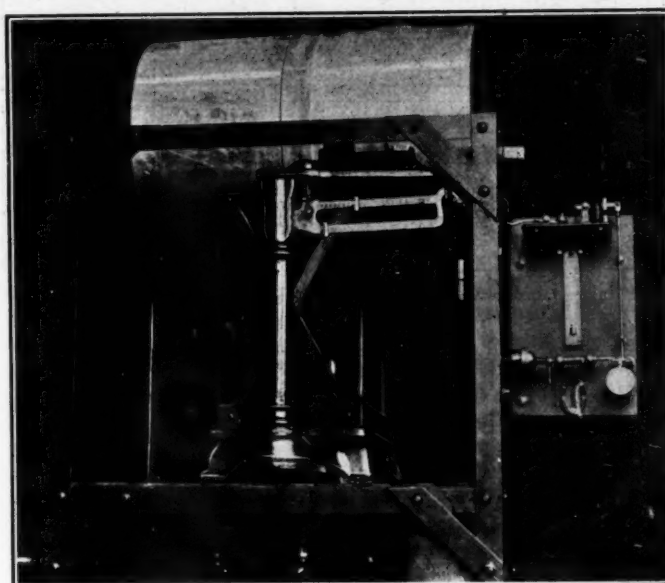


Fig. 3—Fuel measuring device with 50-gallon gasoline tank, telegraphic relay, stop watch and scales to register the time required to consume one pound of fuel and the number of revolutions

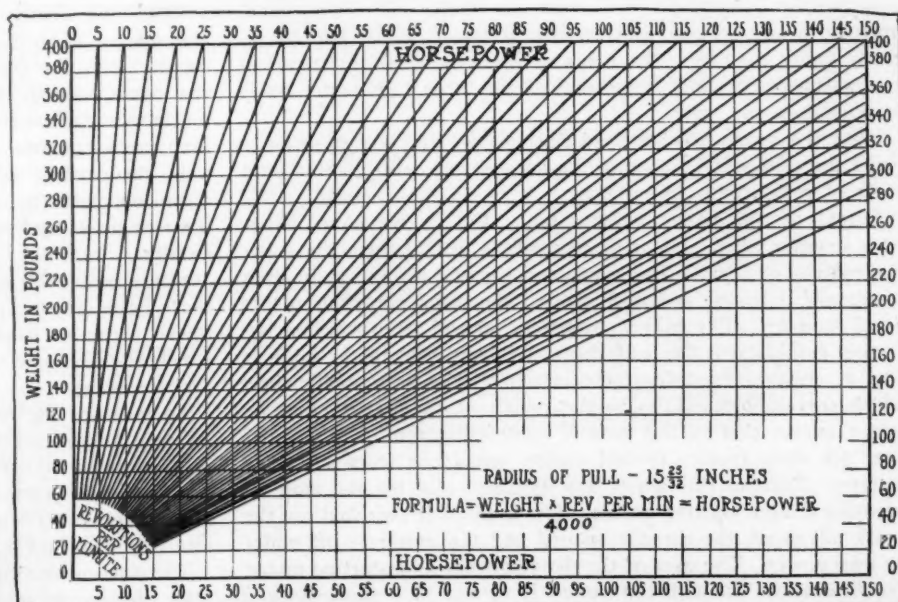


Fig. 4—Conversion chart for changing the pounds pull on the dynamometer to terms of horsepower. The radial lines represent revolutions per minute and start with 50 on the left and run at intervals of 50 up to 2,200 revolutions per minute

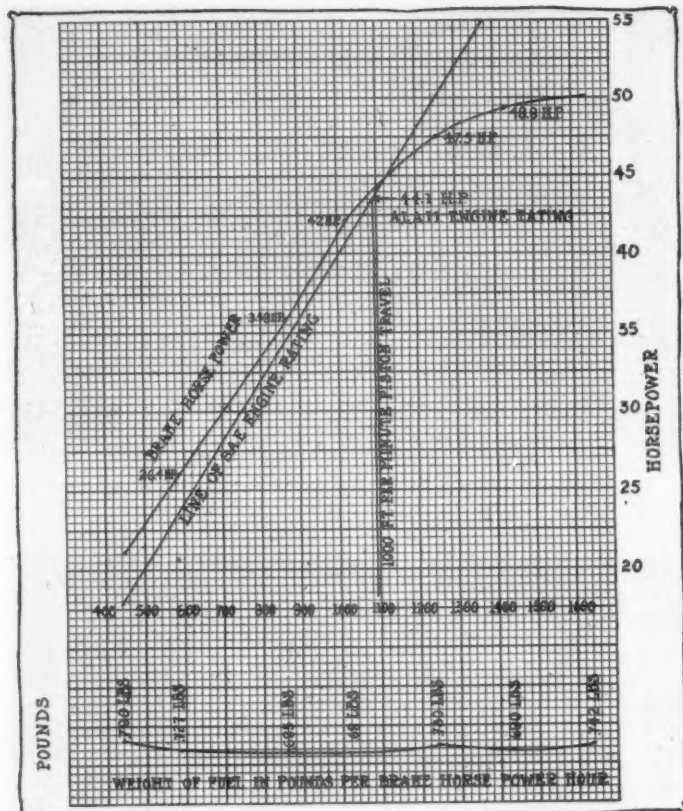


Fig. 5—Horsepower and fuel curve of 44 horsepower motor, Feps carburetor

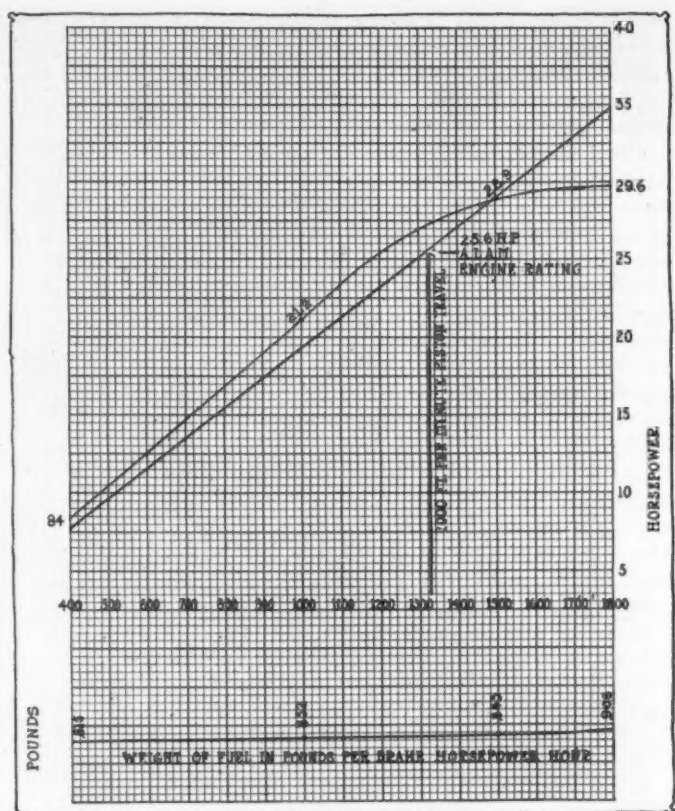


Fig. 6—Horsepower and fuel curve of 25 horsepower motor, Feps carburetor

these readings which are depended on rather than on any readings taken from the spring scale.

One more reading must be taken from the dynamometer besides the pull in pounds exerted by the frame; this is the speed of rotation. In the Diehl installation at the Schoen-Jackson plant there are two tachometers for this purpose. One can be seen in Fig. 1 just behind the spring scale. It is of the mechanical type driven from the motor shaft. It is actuated by weights which spread apart in the manner of a centrifugal governor. The other, an electric tachometer, whose magneto is driven by the shaft at the extremity which projects from the pedestal to the left of Fig. 1. The flexible cable leading to the instrument may be seen dropping down from the shaft. This instrument may be brought to the master control table, Fig. 2, and be directly under the eye of the operator while his assistant stands at the machine and watches the dial of the other tachometer while manipulating the scales.

With the apparatus described thus far we are in a position to make the tests which result in the horsepower curve plotted on a basis of revolutions per minute.

Seated at the master control table, Fig. 2, we have before us a steering wheel similar in all respects to that upon the steering column of a car. The spark and throttle levers are in their customary positions and take care of the usual functions in the usual manner. The wheel, however, instead of governing direction manipulates the field rheostat shown beneath the table in Fig. 2. Just to the left of the steering wheel is a small wheel which corresponds exactly to the switch of an electric cranking motor except that in this case it controls current which comes over the wires from a central station instead of from a storage battery. Turning this wheel, the dynamometer for the moment becomes a huge starting motor. The ignition is switched on, the spark advanced, the throttle opened and the motor is off under its own power. The uses of the dynamometer as a starting motor are now at an end and the switch is turned to a point marked load, which throws the load resistance into circuit. This leaves the engine running under its own power and driving the dynamometer.

The chief operator remains at the control table, while at the dynamometer stands his assistant with his eye on the tachometer and the spring scale. The bar scale is for the time being hooked in place and cannot move. Suppose it is intended to take the first reading at 800 revolutions per minute. The throttle is opened until the desired speed is attained. From this point on, as the throttle is opened, the load is increased by turning the master control wheel, which increases the field resistance through the rheostat seen in Fig. 2. Finally the motor is running at the desired revolutions per minute with the throttle wide open. In other words, the motor is developing its utmost torque at the given number of revolutions per minute.

When the electric tachometer at the elbow of the operator at the master control table registers exactly 800 revolutions per minute with the throttle wide open he signals his assistant at the dynamometer, who immediately checks the speed on the mechanical tachometer and places the beam scales in position to take measurements. At the instant that the chief operator signals, the reading on the scale is taken and noted on a blank form opposite the cross heading 800 revolutions per minute. Two or three readings are taken at this speed to secure accurate results. From the conversion chart, Fig. 4, the horsepower is readily obtainable directly from the readings. After a set of these figures have been obtained they can be arranged in curvilinear form, as shown in the upper section of Figs. 5 and 6, which show sample curves taken on two motors at the Schoen-Jackson plant.

To measure the fuel a very ingenious device, designed at the Schoen-Jackson plant, is used. The 50-gallon gasoline tank is so arranged that the exact time through which 1 pound of fuel is consumed, together with the exact number of revolutions during that time, is measured with extreme exactness. The device is shown in Fig. 3.

The fuel-measuring mechanism consists of the tank, a beam scale, telegraph relay, transmitter, split-second watch and a Veeder revolution counter. The latter is magnetically thrown in and out of gear while the stop-watch is connected mechanically to the telegraph transmitter.

When the engine is operating under any given load the sliding poise on the scale beam, which is graduated to read in tenths of a pound, is set so that it almost floats, but remains in the upper position. As soon as the engine has consumed enough fuel to cause the beam to fall due to the reduced weight of fuel in the tank, the poise is set to 1 pound less and the beam again rises. As the beam dropped it hit the transmitter contact of the relay, which automatically started the stop-watch and threw the gears of the Veeder revolution counter into mesh with the dynamometer shaft. As soon as a pound of fuel has been consumed the beam again drops and through the relay instantly disengages the gears of the Veeder revolution counter and stops the watch, thus accurately registering the time required for the consumption of 1 pound of fuel and the number of revolutions during that time. This test can, of course, be carried on while the horsepower test is in progress and by combining the two the fuel consumption per horsepower-hour is determined. It is entirely possible for the assistant to be carrying out the fuel test while the operator carries on the horsepower test since the gauges for the horsepower test are in plain sight and the spring scale readings may be taken instead of the more delicate beam-scale readings. Since the results are to be plotted along a curve small errors are automatically compensated for by the required fairness of the curve.

The method of laying out the fuel consumption-horsepower curve is comparatively simple. The revolutions per minute can be taken on the tachometer during the time that the test is under way and the reading here checked back on the revolution counter. They should be the same if the motor has run steadily during that period. The pounds of fuel per hour can be figured from the reading on the stop-watch. This supplies sufficient data for the determination of the pounds of fuel per horsepower-hour.

By the use of thermometers and pressure gauges the temperature and pressure of the exhaust gas can be obtained. The pipe is so arranged that the action of a motor with and without a

muffler can be duplicated. A by-pass is also placed in the line of the exhaust pipe so the products of combustion and the contents of the exhaust pipe may be noted at any time. Three vacuum gauges are used to determine the vacuum in the exhaust manifold and carbureter.

For use in determining the amount of water used in cooling there is an arrangement by means of which the temperature of the water entering the jacket can be measured as well as that of the water leaving the jacket. The velocity of the water flow is measured by pitot tubes, and knowing the time and velocity it is readily possible to calculate the flow in pounds per horsepower-hour or in any other units desired.

From the foregoing description it may be seen that there is practically nothing which may not be determined as regards the motor with the testing apparatus as outlined. Various road conditions may be simulated on account of the dynamometer's ability to act as a motor and drive the gasoline engine. For instance, the motor may be allowed to drive the dynamometer under a heavy load, as in climbing a hill, and then the dynamometer may be switched over suddenly to drive the motor as would be the case in going over the brow of the hill when the action of the force of gravity on the car would cause it to revolve the motor rapidly. Other parallels with road conditions may also be simulated by the operator.

With the successful testing of the motor and carbureter well in hand it is but natural that another step forward should be made. This has been done recently by the Diehl Manufacturing Co., which has brought out an entire chassis testing outfit of the type shown in Fig. 7. It is designed by P. P. Dean, their engineer. With this plant the operator may sit in the driver's seat, walk around the chassis or remain at the master control table and test every part of the chassis except the springs. The action of the gearset and rear axle and the different gear reductions may be ascertained. In using the chassis testing dynamometer set, the rear axle is rigidly fixed to a pair of cradles and provided with a pair of chain-sprockets in place of the ordinary wheels.

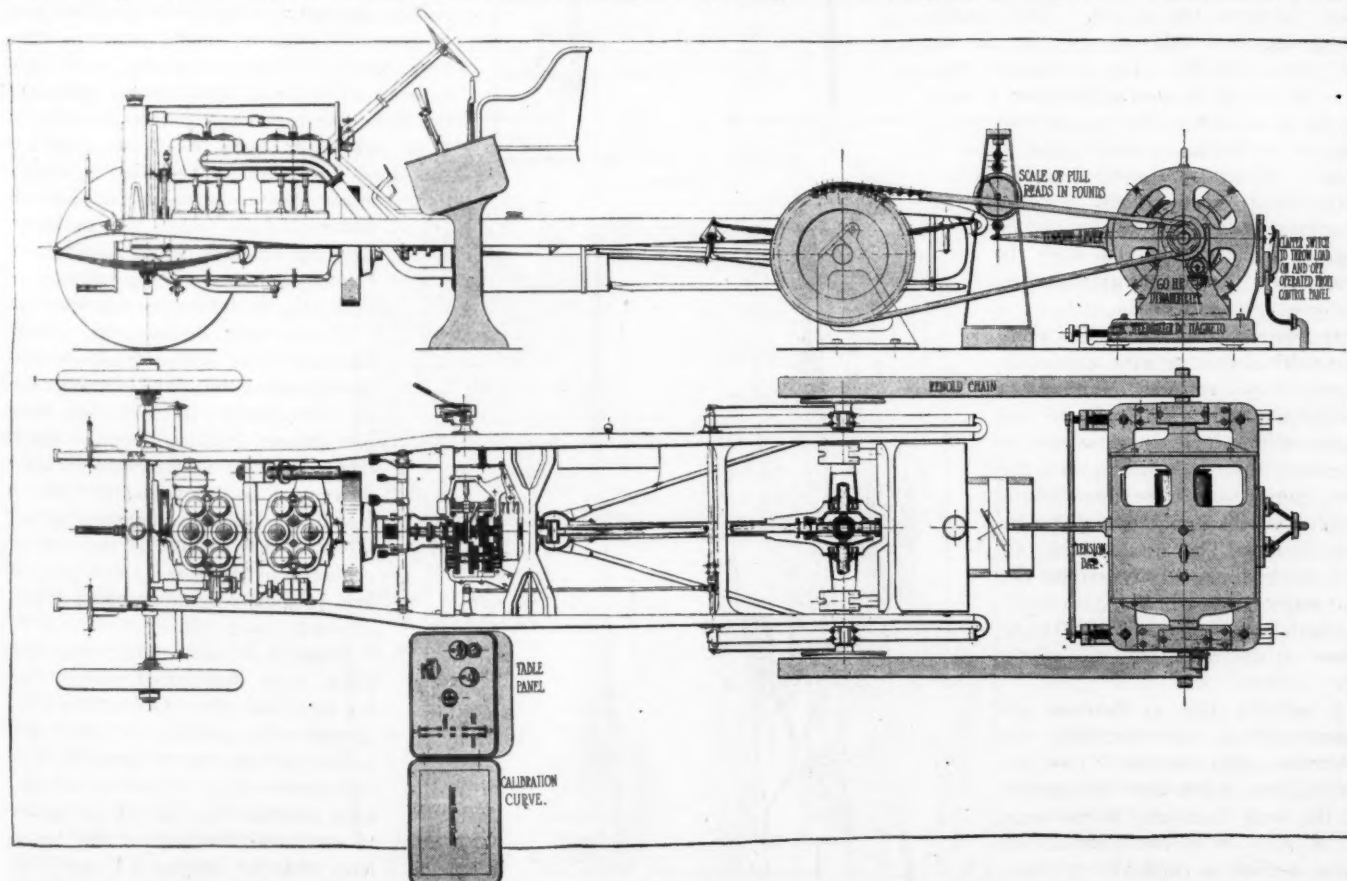


Fig. 7—Dean chassis testing dynamometer, by means of which many of the tests made on the road can be made with greater convenience in the laboratory

Frameless Glass Windows for Automobiles

By George J. Mercer

THE use of frameless glass windows on closed bodies is growing rapidly in favor. At the last Importers' Salon, held in New York, at the Astor Hotel, Jan. 2nd to 11th, there were twenty-two bodies having frameless glass while sixteen had windows with wooden frames.

There are, however, two very noticeable drawbacks connected with the newer method. One of these is the increased liability of breaking the glass, and the other is the letting in of water when it rains or when the car is washed. The letting in of water is not due to a mistake or fault, but is the accompaniment of one of the methods used in operating the glass.

Fig. 1, A, a cross section through the body of a limousine, shows the door pillar with the glass suspended by the lift strap. This window is of the frameless glass type and as illustrated the glass travels in a straight groove extending from top to bottom of the pillar, being supported at all times by the strap. The metal channel in which the lower edge of the glass rests and to which the strap is attached, is continuous across the whole width of the glass between the pillars. This channel always remains below the top of the bar and out of sight. The necessary clearance, however, to enable the glass to pass by the back face of the bar without touching, is sufficient to enable the water to enter. Where this method is employed, provision is made at the bottom of the door and body for drainage, and if the construction of the body is practically all metal no great inconvenience is experienced.

In some of the best bodies made this method is used with apparently satisfactory results. The two strong features in its favor are the safety with which the glass can be operated without breaking, and the opportunity that it presents of utilizing a mechanically operated lifting device. The disadvantage of this method is that it permits the entrance of water in the glass pockets with a consequent deteriorating effect on the wood framing of the body.

B and B1, Fig. 1, illustrate another method of operating the frameless glass window. Two positions are shown and the section of the body illustrated is the same as at A. These two illustrations show a method employed to overcome the tendency of the glass breaking when raised and lowered,

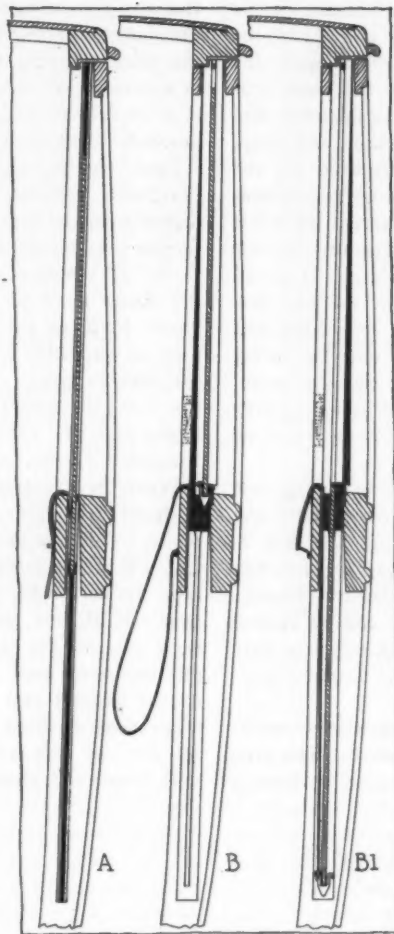


Fig. 1—Sections showing two methods of fitting

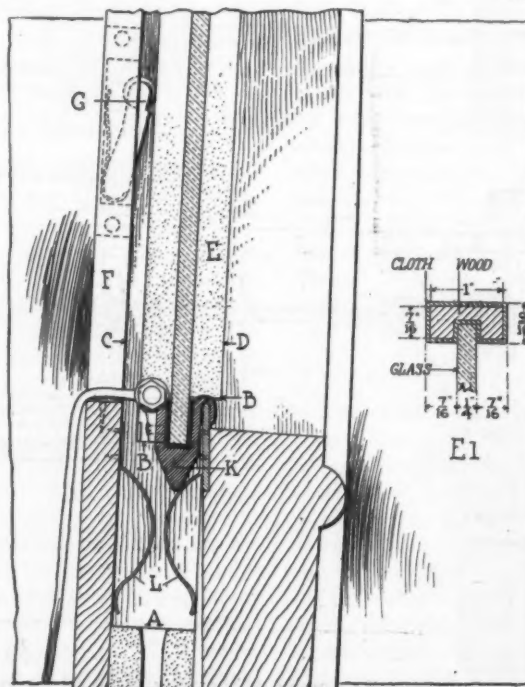


Fig. 2—Watertight method of supporting window

Body Designer

and at the same time keep out the water. B shows the glass raised and the entrance of water effectively barred, while B1 shows the glass dropped to its lowest position in the pocket.

Fig. 2, an enlarged view of the door bar at B, Fig. 1, better illustrates the glass in raised position. The wood channel in which the glass moves up and down, is not one continuous piece, but is parted and is put in the pillar in two pieces. The lower half is stationary in the pillar and the top and terminates at A. The upper half of the channel is fastened with one wood screw at the top, in the center. With this screw as the pivot point the lower end of the channel moves in the arc of the circle from C to D and carries the glass with it. This channel terminates at the lower end at BB. A cross section showing the dimensions of the channel is given at E1. At the rear of the glass the channel has a downward extension so as to support the glass when the pull comes on the strap.

Across the lower edge of the glass is the metal channel K. The glass rests in this channel, being first protected by a rubber channel that fits over the glass and in turn fits into the metal groove. This metal channel K is very strong, so as not to bend when the strap is drawn tight. At the front the metal terminates in a lip or hook that slips over the fence iron on the door bar, thereby forming a watertight contact that prevents any leakage of water into the body. On the inner side the channel is flat and to the center are fastened lugs that provide attachment for the lifting strap.

The position of the glass as illustrated is with the opening closed, when the glass is supported by the metal lip of the bottom channel hooking over the fence iron. In order to facilitate an easy movement forward of the channel containing the glass, a strong spring G, fitted with a roller at the end, is pocketed in the side of the groove and presses constantly against the channel.

When it is desired to lower the glass, it is first lifted slightly by the strap and then lowered, the two springs LL guiding it into the groove of the lower channel that commences at A. When in its lowered position the top of the glass is even with the top of the fence iron and the springs LL perform the duty of holding the glass rigid and prevent rattling.

Mirrors For Dangerous Street Corners

Insure Safety

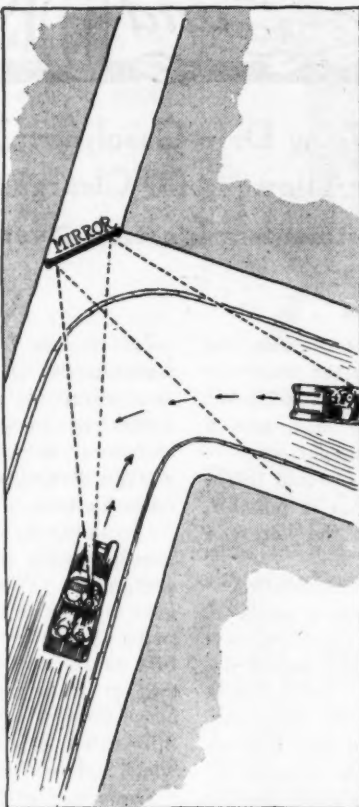
ALL motorists are familiar with that feeling of uneasiness which is experienced when driving toward a blind corner. There is always present the danger of some careless road user looming out of the hidden approach too late to avoid a collision. In this connection the extensive use of rear view mirrors on automobiles must often have suggested to drivers the possibility of using a larger fixed reflector at the dangerous street corners, to show the approaching vehicle. But, strangely enough very little has been done in the way of actual experiment with such a device. The success, however, attending the adoption of these mirrors in the few places where trials have been made renders the available information of great interest to road users.

Some years ago the Touring Club of France placed mirrors of this type at dangerous turns on the Corniche road at Menton and Ventimiglia with satisfactory results. And at a few towns in England similar success has followed the use of these devices.

In Folkestone, England, at a street crossing where previously accidents were of frequent occurrence, the roads at that point carrying quick traffic, a mirror 2 feet square has been in use since June, 1910. With reference to it, A. E. Nichols, borough engineer and surveyor of that town says: "Since the mirror has been fixed I have not heard of anything approaching an accident, and as a motorist myself have personally experienced its value. I do not find that the damp, mist, rain or frost has any ill-effects on the mirror, which is occasionally cleaned by a passing lamplighter when cleaning his lamps. Nor do I think apparatus of this description unduly encourages high speed at turnings. I do suggest, however, that these street mirrors would be of much greater value if they were very slightly convex, in order that a very much greater area could be observed than is possible with a flat mirror."

The reflector in question is mounted at a suitable angle on an upright of 1.5 inch gas pipe, driven into the ground.

With regard to the important point of including a greater or lesser amount of reflected area it is of interest to note that at a similarly dangerous street corner in Malmesbury, another English town, a larger flat mirror, measuring 8 feet by 5 feet is at present in suc-



Plan of turning, showing radius of view included in mirror as car approaches the point of danger

Practical Results

cessful use. This is mounted on two vertical pillars on the sidewalk, the long side being placed horizontally, leaving sufficient headway for pedestrians. The large size brings up the question of unsightliness and also the possibility of objection on the part of the occupants of adjacent houses, and suggests the desirability of experiment with smaller convex surfaces.

In fitting mirrors of this description, the deteriorating effects of the weather make it necessary to take into account several constructional considerations. The most important of these is that of the silvering. Ordinary mirror silvering, to meet interior conditions is not sufficiently heavy to prevent oxidation. The thin protective paint backing as generally applied is also inadequate for exterior requirements. This coating must be thicker and so mixed that extreme variations of heat do not tend to cause cracking of the surface and consequent peeling or exposure of the silvering.

The thickness of glass used is also a point of considerable importance although only partly connected with the weather conditions. All glass is porous to some extent and therefore the thicker it is in mirrors the less trouble will be experienced in causing oxidation of the reflecting surface. But while thick plate glass is an advantage in this respect it

has the great drawback of causing a double image when used as a street corner reflector. This is due to the refraction of the glass. Refraction is always present, but its effect is negligible when the entering ray is not removed far from the normal, as for instance, when an observer looks at his own reflection. In this case the entering ray is at 90 degrees. In the particular mirrors in question, however, the angle of incidence, or relation of the sight line to the mirror surface is in the neighborhood of 45 degrees, and the refraction then becomes a serious objection, causing a confused image. If the glass is thin this drawback is lessened, but the liability of breakage through accident or wilful damage is increased and therefore some suitable mean thickness should be adopted.

This question of street corner reflectors is well worthy the serious consideration of city authorities.



Method of mounting safety mirror at city street corner, showing approaching car, hidden from view by the building



Cleaning Out the Crankcase—Using Drip Gasoline—The Differential Gear—Overheating Causes Power Loss—Allowing for Clearance—Gas Turbines—Concave Piston Motor—On Adjustments—Ignition System on the 1910 Mitchell

Removing Oil from Crankcase

EDITOR THE AUTOMOBILE:—I have seen several directions, at different times, to remove the oil from the crankcase of the motor and to flush the latter out with kerosene. I have a car which, according to my instruction book, uses a splash system of oil. I am very much of an amateur when it comes to doing any work around the motor and I would therefore appreciate specific directions, with illustrations if possible, telling how to remove this oil and how to get the kerosene to the correct spot.

New Bedford, Mass.

SUBSCRIBER.

—You will note on the bottom of your crankcase a series of petcocks and a drain plug, as shown in Fig. 1. Open the petcocks and remove the drain plug. This will not only permit the oil to flow from the splash troughs, but will also remove that which is contained in the oil reservoir. After all the oil is out, pour 2 quarts of kerosene in the breather pipe or oil filler hole, as shown in Fig. 2. Run the motor for about 30 seconds—no longer—then open the petcocks and the drain plug again and let the kerosene flow out. After this has drained thoroughly replace with new fresh oil.

Use of Drip Gasoline

EDITOR THE AUTOMOBILE:—Do you think it a safe and sane plan to use drip gasoline (caught direct from a well) in a 30-horsepower motor without any refining? I know a number of people who use it and claim it more powerful and quicker than refined gasoline, although it smokes and causes more carbon. I can get plenty of it for almost nothing, and have been thinking of buying some refined gasoline with good gravity, then using half refined and half drip. I think by mixing it it will be safer and better fuel than using the drip gasoline alone, but would like to have the opinion of someone with more experience than myself before trying it.

Metz, W. Va.

L. C. S.

—Drip gasoline taken directly from the well cannot harm your motor. If your carbureter can handle it there is no reason why you should not take advantage of the low price at which you can secure it. Before using the drip gasoline, or any other gasoline, as a matter of fact, it is necessary to strain it through chamois skin or through two or three layers of exceedingly fine wire gauze mesh. It would not be wise to mix refined gasoline with the heavier fuel; the result of this would be that even if it did arrive in its mixed state at the nozzle of the carbureter the gasoline constituent would be evaporated while the less volatile part of the mixture would remain in globular form.

When using the heavier fuel you will find that a different carbureter adjustment is necessary. From 50 to 100 per cent. more air is required than with the higher grades of refined gasoline. The reason for this is that owing to the difficulties of evaporation it is necessary to pass more air over the surface of the unevaporated gasoline than would be the case where the more volatile products were used.

Action of Differential Gear

EDITOR THE AUTOMOBILE:—Would you kindly tell me if the engine power of an automobile is distributed equally to the two rear wheels in taking a turn or corner or if the most power is transmitted to the outside wheel? Also if running at 15 miles an hour on the straight and without changing your throttle lever you go around a corner, if the speedometer will go above 15 miles an hour with the same amount of gas?

Clermont, N. Y.

R. R. SAULPAUGH.

—In turning a corner more power is exerted by the outside rear wheel. When the front wheels are turned by the steering gear in order to make the car turn a corner they force the car to swing about the inside rear wheel as a pivot. This wheel therefore exerts very little power. The narrower the circle in which the car is turned the more stationary the inside wheels and hence the less power exerted by this wheel. The action of the differential is such that the power is transmitted to the wheel which opposes the least resistance to its motion.

The action of the speedometer is altogether dependent on the peripheral speed of the wheel to which it is geared. When turning a corner if the wheel to which the speedometer is geared is the outside wheel it will show a greater mileage per hour than it would were it the inside wheel. In other words, the odometer shows the number of miles traveled by the wheel to which it is geared. If the car were traveling around a circular track the outside wheels would travel a greater distance than the inside wheels, and hence if the speedometer were geared to the outside wheels it would show a greater mileage than when geared to the inside wheel. As the number of left and right turns made in a day are very nearly equal, and since most of the running is done along straight roads, the report of the odometer at the end of the day is generally accurate.

Cooling Water Boiled Suddenly

EDITOR THE AUTOMOBILE:—Recently on a trip to Peoria, a distance of 12 miles, my engine ran well. On the return trip, however, when about half way home, the motor lost power rather suddenly and the water boiled violently. At first I thought the carbureter was flooding, but examination showed that it was not flooding. The carbureter adjustments are the same as they have been for nearly 3 years. There was no popping or back firing into the carbureter or exhaust manifolds. After arriving home I removed the valves and proceeded to grind them, even though they did not seem to need it. I looked for carbon deposits, but found not enough to cause much trouble. I very seldom use hard water in the radiator, and I have a habit of draining it often. The carbureter is a Schebler. The ignition, Remy type "S" and the motor a Regal.

Now, what, in your opinion, caused this boiling of the water and the loss of power, for the motor would not pull on high gear on a level road?

Spring Bay, Ill.

WILLIAM L. ZELLER.

—There is only one thing that could cause the cooling water

to boil suddenly in the radiator in this manner and that is the failure of the water to circulate. This could be due to but two causes. First, breakage of the water pump, and, second, to the clogging of the cooling system by some foreign matter.

The second is the probable cause and may be cured by pouring a pail of boiling water and soda through the radiator and then flushing this out with two or more pails of hot water. If the tendency to clog be very marked and the deposit stubborn, the motor may be run for a few moments with the soda water in the system if so desired. The proportion of soda to water should be about a double handful to each pail of water.

Should the pump drive, or the pump itself be damaged, it is a matter of replacing the damaged parts. It would also be wise to look at the spark and throttle linkage to see if either of these could possibly have become disarranged.

Design of Diesel Motor

Editor THE AUTOMOBILE:—Can you tell me where I can secure a book on the theory and design of the Diesel motor? Also where I can get the data published by the S. A. E. in loose-leaf? Watertown, S. D.

W. H. McCULLOUGH.

—The best place to secure data regarding the theory, design and construction of the Diesel motor would be from the Diesel Engine Co., Busch-Sulzer Bros., 30 Church street, New York City. The literature furnished by this company goes deeply into the principles of the Diesel motor and its manufacture.

2—The loose-leaf data given out by the S. A. E. can be secured by addressing Coker Clarkson, care of the Society of Automobile Engineers, 1786 Broadway, New York City.

Wants to Use Bell Signal

Editor THE AUTOMOBILE:—I disposed of my automobile last fall, and I thought I would quit, but as spring approaches I feel the fever coming on again and suppose nothing will do but get one. On my former automobiles I found the bulb horn very unreliable. Would you kindly inform me is there any regulation, rules, ordinances or laws, city or state, forbidding the use of bells on automobiles, such as used by the city fire department or ambulances?

Mt. Vernon, N. Y.

A. D. EVERTSEN.

—The law of New York on warning signals states that each car shall be provided with an adequate horn, bell or other signal. There is nothing which would prevent you from using a bell if you so desire. It would be inadvisable, however, to equip yourself with a bell identical with that used by the ambulances or fire department of your city, as you would find yourself in trouble with the local authorities.

Correct Allowance for Clearance

Editor THE AUTOMOBILE:—The cylinders of my Stoddard-Dayton have worn so as to allow pistons to slap. Cylinders now

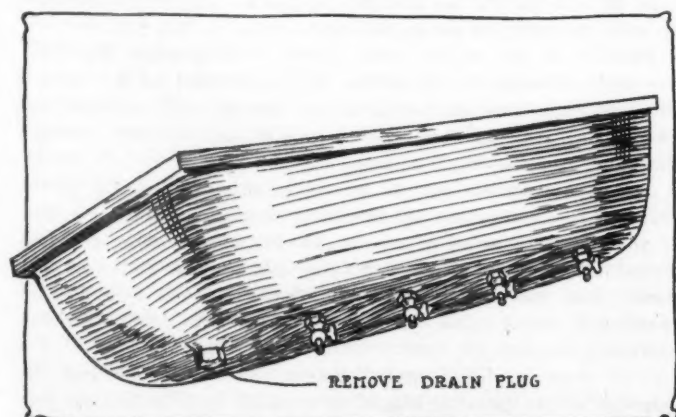


Fig. 1—Petcocks on the bottom of the crankcase should be opened and the drain plug removed to clean out the old oil

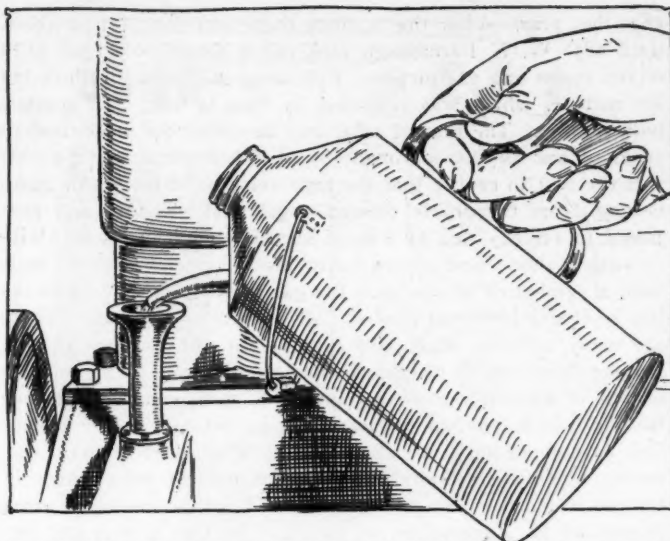


Fig. 2—About 2 quarts of kerosene should be poured into the filler hole after the old oil has been removed

measure 4.742 and I have ordered pistons measuring 4.752. Would it be better to have cylinders bored at a machine shop or could a satisfactory job be done by grinding down with emery using the old piston as a grinding tool. What is the proper clearance to allow for expansion between piston and cylinder walls?

Holyoke, Mass.

CYLINDER.

—The correct clearance at the top of the piston is .004 inch and at the bottom or skirt of the piston .002 inch would be correct. The clearance between the top and bottom of the piston is decreased .0005 at each of the rings. This gives a sort of stepped taper which has been found to correctly take up all slaps and leave a good, quiet-running motor.

It would not be wise to attempt to use the old piston as a grinding tool in reboring the cylinder. This should be done at a machine shop which has the correct equipment for doing this work.

Vulcanizer for Garage Purposes

Editor THE AUTOMOBILE:—I am about to purchase a vulcanizing plant and not having any experience in that line, I would like to have you tell me what make of plant would you advise me to buy.

Is there any special objection to the Haywood system? What kind of stock is best for use with the Haywood system? Is retreading practical with any style of vulcanizer?

Natick, Mass.

L. E. DAVIS.

—The Haywood system is excellent for garage purposes. It is made by the Haywood Tire & Equipment Co., of Indianapolis, Ind. Besides this concern there are several others which make excellent systems for garage use. Among these may be mentioned the following:

Auto Tire Vulcanizing Co., Lowell, Mass.
Biggs Boiler Works Co., Akron, O.
Burge Machine Works, Chicago, Ill.
Diamond Mfg. Co., Des Moines, Ia.
Milwaukee Auto Specialty Co., Milwaukee, Wis.
Schafer Company, Waupun, Wis.
Westinghouse Electric and Mfg. Co., Pittsburgh, Pa.
Williams Foundry and Machine Co., Akron, O.

Gas Turbines In Existence

Editor THE AUTOMOBILE:—Do you know of anyone who has experimented on a turbine operated by gasoline, and, if so, what advance has been made?

Cumberland, Md.

J. H. DANTZIC.

—Gas turbines have been experimented upon for a number of years; as far back as 1648 there have been traces of investigation of this type of motor. One of the earliest of which we have knowledge is the gas turbine designed by Barber, who patented his device in England in 1791. His patent number was

1833 that year. After that nothing more was done for 50 years, until 1850 W. F. Fernihaugh took out a patent No. 1,328 on a mixed steam and gas turbine. Following this came Burdin's hot air turbine, which was proposed by him in 1847 and actually built in 1853. The first of what may be called the more modern types of gas turbine was made by M. W. Boulton in 1864. He was the first to realize that the high velocity of the jet of gases issuing from the nozzle offered a practical difficulty and proposed to remedy this by use of successive induced jets of increasing volume and consequently lower velocity. There have been a number of works upon the gas turbine, one the latest being by Henry Harrison Supplee, J. B. Lippincott Co., 1910. There are many turbines which are suitable for either steam or gas. Among these may be mentioned Bucholz, of which an account appeared in *Electrical Review*, January 8, 1904, and the Patschke turbine, which has had extensive use in Germany. The French firm of Armengaud & Lemale have gas turbines up to 300 horsepower which are actually in use at the present time. Another turbine which has been brought forward within the last 3 years is that of M. Karavodine, of Paris. The reason that gas turbines have not become more popular and brought into general use is that the efficiency obtained with them has been very low.

Desires Motor Encyclopedia

Editor THE AUTOMOBILE:—Is there any encyclopedia or text published on modern automobile engineering and design? What is desired is something quite complete and useful to the automobile engineer, setting forth the best practice together with a good list of formulæ and plenty of diagrams and results of tests.
Bozeman, Mont.

ARTHUR C. FORD.

—There is an encyclopedia of automobile engineering published by the American School of Correspondence, Chicago, Ill.

Theory of Concave Piston Motor

Editor THE AUTOMOBILE:—Kindly advise whether in your opinion one of the results obtained from an L-head engine of the general design shown in Fig. 3 as compared with the ordinary domed cylinder type will be a stratification of the burned gas above the piston with the fresh charge unmixed with it or partially mixed above it.

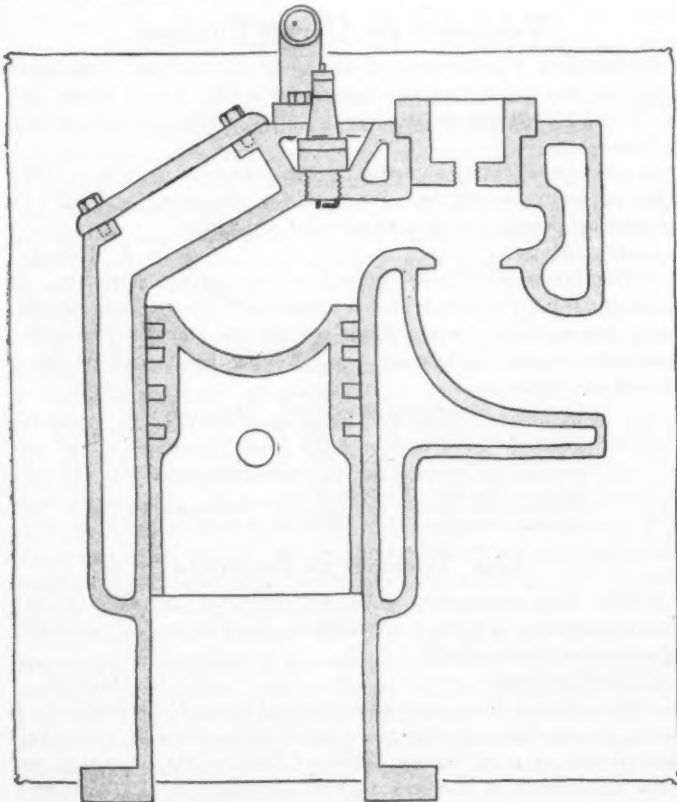


Fig. 3—Novel L-head motor design embodying a concave piston

2—Would such a stratification result in more rapid combustion, higher initial and mean effective pressure?

3—Would the central location of the spark-plug tend to produce the increased power resulting from the use of a two-spark system in T-head engines?

4—Would the burned gases on the piston tend to cushion the more violent explosion?

5—Is not the claimed increased power of Knight and V and H engines due to similar stratification rather than to cleaner scavenging, it being, of course, assumed that the engines compared have the same displacement and compression and are identical as to gas passages, size and lift of valves.

Port Henry, N. Y.

F. E. BACHMAN.

—1—Such a stratification would probably result owing to the fact that there would be a pocket formed in the bottom of the piston bowl.

2—It is impossible to state that such a stratification would result in any better combustive efficiency. It is absolutely impossible to get any definite data of this nature through drawings or for the motor itself without the aid of indicator or manograph cards.

3—The central location of the spark-plug would doubtless be the most advantageous for the shape of combustion chamber which you have in your motor. It would not give the rapidity of combustion that would be secured by two sparks.

4—The burnt gases on the piston would not act as a cushion because the pressure in any part of the combustion chamber is the same at any instant. Besides this, no cushioning effect, which would virtually amount to slower combustion and expansion, is necessary.

5—The basis of advantages claimed for Knight and valve-in-head motors has never been laid to stratification. The reason for this is that nobody has ever proved definitely that stratification existed within the cylinder.

Some Pertinent Adjustment Queries

Editor THE AUTOMOBILE:—1—Would it be advisable in order to stop compression leaks to use white lead on the threads of the petcocks, gaskets, etc? If not, what would you advise?

2—How can I stop a slight leak through the petcock, due to its not closing tightly?

3—I have read your answer on eliminating noise caused by tapping of loose valves in your magazine of October 17, 1912, but should like to know if after the engine is heated up there is still a space between the valve stem and tappet, would it be advisable to further tighten the valve?

4—Do you think it shall be necessary to retune the valves on a car which has been run only 3,500 miles? It is a Cadillac 1912.

5—In the directions for readjusting the carburetor there is one given to "adjust screw E until the motor attains a speed of 280 to 300 revolutions per minute." How can this speed be determined by an inexperienced person?

6—Do you think a tap would be caused by worn cam-followers, as you suggested, in an engine run as little as this?

Oakland, N. J.

WALDEMAR BÜSING.

—1—It is better to use shellac than white lead on the threads of the cylinder petcocks, gaskets, etc. Shellac will withstand the effects of heat better than white lead and does not offer as much resistance to removing the parts.

2—The leak in the petcock can be stopped by grinding in the valve or, since they are so cheap, by simply fitting a new one. If you desire to grind it in you can put a little valve grinding compound between the petcock valve and its seat and work the handle back and forth in the same manner as you would do in grinding a poppet valve. This will make a tight fit between the valve and its seat.

3—If there is still a space between the valve stem and the tappet after the motor is heated up it would be wise to close this gap by turning the adjustment nut. The clearance between the tappet and stem when the motor is cold should be .003 inch.

4—It should not be necessary to retune the valves on a car

which has run 3,500 miles. You might check the timing by noting the marks on the flywheel and seeing if they agree with the action of the valve. For instance, where the flywheel is marked E.O. 1 it means the exhaust valve on cylinder one is just starting to open when the mark at E.O. 1 is just opposite the indicator.

5—It is impossible for an inexperienced person to accurately estimate the revolutions per minute of a motor. Three hundred revolutions per minute, however, would be just about the point at which the motor appears to be running rapidly but not racing. This may give you a vague idea of the speed. With the spark in medium position 300 revolutions per minute would probably be obtained when the throttle was opened a little less than one-quarter way, assuming the gears to be in neutral.

6—A tap may be caused by a worn cam follower in any motor, although it is not likely to be the case with a car run such a short time.

From Hattiesburg to Chicago

Editor THE AUTOMOBILE:—Can you furnish map showing route taken by Glidden Tour? I want to go from Hattiesburg to Chicago in my car and would like advice as to the best way to go.

Hattiesburg, Miss.

H. S. LILIUS.

—It will be necessary for you to take whatever roads you can find from Hattiesburg to Newton, which is a few miles north of you. From Newton to Jackson leading through Brandon. Once at Jackson you are in a position to take the regular Blue Book routes north as compiled from the 1910 Glidden Tour, which passed through that city. Your course will lie through Canton, Lexington, Greenwood, Memphis, Middleton, Tuscumbia, Nashville, Bowling Green, Cave City, Louisville, Indianapolis, Lafayette, Chicago. These routes will be found in Volumes 3 and 4 of the Blue Book.

Ignition on 1910 Mitchell Car

Editor THE AUTOMOBILE:—Would you please explain the ignition system used on 1910 model T Mitchell? My car has a Splitdorf magneto. I gave my car an overhauling, ground the valves and had it all apart and since I put it together it does not seem to have the same compression it had before I sent the magneto to the repair shop and had it tested and fixed up, but I cannot get any ignition. Why?

Some time ago I started to take my car out and after running about 10 feet out of the garage my transmission subshaft broke. I had a new one made and then I went about 15 miles, and not running over 15 miles per hour, and my subshaft broke for the second time. The car was not handled rough, making all changes in gear as they should be; each break looked as though the shaft was twisted off. I have not had car out since my last break.

Pittsburgh, Pa.

GEORGE E. KESTNER.

—The system on this car consists of a low-tension magneto with a tube transformer. The diagram of the wiring system is given in Fig. 4. The system will be readily understood from the diagram and but one precaution need be observed, that is, that both poles of the battery must be brought to the transformer. The battery should not be grounded under any circumstances. The current for ignition is generated by the low-tension magneto and is then led up through the transformer, where its voltage is increased to such an extent that it readily jumps the 1-32-inch gap between the spark-plug electrodes. It may be that the reason you did not get a spark is that you have grounded the battery current.

It is natural that immediately after the valves have been ground that the compression will be lower than usual. This condition will disappear after running a short time. The reason for this is the fact that the piston rings do not get a running fit for some time after they are removed.

It is impossible to state why the gearset shaft broke unless it was improperly lined up or unless it had a bend in it. It might be possible that the bearing surface for the layshaft is too small

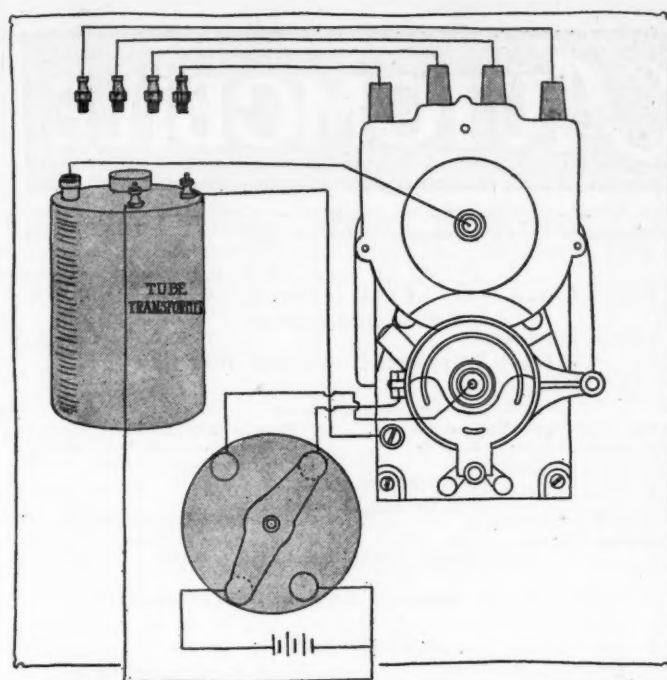


Fig. 4—Diagram of 1910 Mitchell Ignition wiring system

or that the bearings are too far apart to furnish adequate support.

Editor THE AUTOMOBILE:—Apropos of the recent controversy regarding whether automobile shows pay or not, it strikes me that there being such a question is in itself a circumstance which would indicate that something is fundamentally wrong with the big shows. A report of the 1912 Paris salon—which, if I am not mistaken, appeared in THE AUTOMOBILE—stated that after paying for the cost of the show, a surplus was left which was distributed among the exhibitors.

While the number of show visitors at New York and Chicago was a large one, it has been stated that some 40 per cent. of the people that went to see these exhibitions had complimentary tickets. The question then arises, was it necessary to give these people gratis tickets, or would they have paid admission to see the shows?

In my mind, the answer is: No, they would not have paid. For the majority of these people are not necessarily interested in automobiles for the immediate future, though they are possible buyers for some time hence. Yet, in a city like New York or Chicago, which every evening has scores of entertainments for the man who is seeking them, an exhibition to which people are expected to come and to pay for their tickets, must be made as attractive as any other entertainment. People want to enjoy themselves, not to be educated. Soloist singers of the cabaret style and adequate dinner and tea facilities should be there.

Furthermore, if fewer complimentary tickets had been distributed and that with utmost care, the paid tickets selling at \$1 should have made the show a commercial success. If only well-to-do people would come to the shows, all of them would be there. And these are all that are looked for.

New York City.

D. VON BERN.

Simplex Car Has Force Feed

Editor THE AUTOMOBILE:—Will you please tell me if the Simplex company of New York are going to put out a new car for 1914 with steel pistons and force feed lubrication? If they are can you give me the specifications?

Alton, N. H.

H. P. TIBBETTS.

—The Simplex for 1914 will no doubt use the force feed lubricating system as is the case this year. The possibility of its using steel pistons is very remote. There is no intention of doing so at present.

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Silk Stockings on Trucks

IT is not surprising that the members of the National Association of Automobile Manufacturers at their regular meeting last week should vote practically unanimously for a recommendation that the commercial vehicle shows at New York and Chicago be discontinued, ostensibly on account of the expense to the manufacturer in conducting them, failure to make the anticipated sales, because of poor attendance and sundry other reasons.

You do not dress a football hero up in court costume when he is going into one of the severest battles of the year on the gridiron, neither does the business man go to his office in evening dress to transact the business affairs of the day. The commercial vehicle shows up to the present have been carried on in the dress and setting of the passenger car shows. The walls of glass and mirrors to add attractiveness to the polished lines of the passenger car have been used when the coal-dumping truck, the lumber truck, the brewery truck and the emergency repair wagon, have filled the exhibit spaces on the following week.

These vehicles designed for business have been taken out of their proper setting. They have been transported from what should be an atmosphere permeated with everything that is most businesslike in the transpor-

tation field, and deposited in what would be the same environment as a person wishes to enter when buying a spring hat or Easter gloves.

Even in the conduct of shows for motor trucks recognition must be had of those universal feelings and influences in life. Shakespeare wrote: "How many things by season seasoned are!" What could be more true? Apply this to the present style of motor truck shows, and it must be admitted that it would be more rational to demonstrate these vehicles of labor on the boulevards of Central or Jackson parks than to hedge them in with mirrors and church windows in an exposition building.

The fact that the present type of show has proven a failure, as the manufacturers admit by their action, is no reason that they should come to the conclusion that commercial vehicle shows are all failures. Far from it. Such a course is precipitant. Such decisions will be changed by the passage of time. There is need to-day for commercial vehicle shows, but they must be held at the proper time, in the proper place, and in the proper manner.

The week following the passenger car shows is not the proper time for a commercial vehicle exposition. It does not meet with the conveniences of many business houses. It comes too close at the end of their fiscal year, it being a well understood business fact that few concerns make large investments, such as motor truck equipment calls for, nearing the end of a fiscal year or immediately upon the opening of another year's business.

A better season for the show is in the early spring or early fall. These are the periods of greatest purchasing by the largest industrial houses.

A combination exposition and demonstration is needed. It is not sufficiently convincing to display commercial vehicles with dumping bodies passively on a carpeted floor. They should be out actually operating in a zone of business activity where every warp and woof of interest would prove an additional force in the selling arguments.

Such a program is not impossible. During a show extending over one week certain hours of each afternoon could be devoted exclusively to such demonstration work. These demonstrations could be in actual progress in some outlying section of the city. In either New York or Chicago it is possible to secure such demonstration grounds within short distances of the exposition centers. Long Island City affords excellent room in the East; and in Chicago the Lake front would more than meet every requirement.

But the outside demonstration must go further. All trucks have not dumping bodies, and only a small percentage of the buyers are looking for such a design. Other afternoons can be given over to some forms of city demonstration, or inter-urban work. These outside demonstrations should also be outlined to bring forth the time-saving aspects of the truck. Time-saving loading apparatus and unloading apparatus should form a part of such demonstration. These assume the forms of endless conveyors, traveling buckets, cranes, chutes, etc., and there is no reason why the adaptation of these for loading and unloading means should not be dwelt upon. There is no end to the rational ramifications for good of a combined commercial vehicle exposition and demonstration in at least three, or perhaps five, of our biggest American cities.

Is Barometer of Value in Motor Tests?

Following Introductory Paper by Herbert Chase on Fischer Motor, Ferdinand Jehle Put This Hypothetical Question up to Detroit Section of S. A. E.

Abbreviated report of Section meeting held at Detroit last Friday.

DETROIT, MICH., March 7—A representative gathering of automobile experts was present at last night's meeting of the Detroit Section of the Society of Automobile Engineers, which was the first to be held since December, the national shows having occupied the attention of the members during January and February.

The session was particularly interesting because of the presentation of the report of the test by the Automobile Club of America of the Martin Fischer slide valve motor by Herbert Chase, the club's laboratory engineer. A paper in explanation of this non-poppet type, which is being introduced in this country by L. B. Brown and George Ratcliffe under the name of the Magic motor, was read at the last meeting of the section, its unique crescent valve slides being the principal distinguishing feature, and Mr. Chase's report answered many of the questions which were left open from lack of data at that time.

Mr. Chase's report did not seek to compare the motor with other existing types of engines in any way, nor to offer any comment as to the results obtained. It was merely a presentation of the facts as obtained in the club's laboratory and to which the club was willing to give its official signature. The report was supplemented by lantern slides showing some of the special apparatus used for the test and the arrangement of the various apparatus, as well as curves plotted from the data obtained and manograph cards of both working and pump strokes. There was no special discussion of the results set forth in the report.

The second paper of the evening was read by Ferdinand Jehle of the Commercial Engineering Laboratories, this city. Mr. Jehle's subject was: "Are Barometric, Temperature and Humidity Readings of Any Value in Comparative Motor Tests?" Mr. Jehle did not attempt to answer the question but merely wished to set the facts before the engineers so as to bring out a discussion of the subject, and possibly, to cause some careful and scientific investigation to be made along this line in the near future. He took the stand that the ordinary variations in the temperature, barometer and relative humidity readings do not appreciably affect the practical comparative tests of motors, although there may be very slight differences due to them.

When one motor does not show up as well as another in test, these atmospheric conditions are blamed for the poor showing, thus offering a loophole. Calculations were offered to show that even with the most extreme differences in atmospheric conditions, coupled with the maximum effects which they could cause, no such differences should be taken into consideration.

Mr. Jehle stated that the only way in which we can arrive at definite conclusions on this subject is to run special tests with this particular end in view. "Some of us have cold rooms in which motor tests can be run," he said. "In these we could control the temperature and possibly the humidity. The pressure of the entering air might be controlled by a small blower. Such tests would be of real value. They would show better what differences atmospheric changes bring about than any calculation."

The general trend of the discussion which followed was toward the views held by Mr. Jehle, barometric changes due to altitude and humidity variations being taken up, principally in

their effects upon carburetion. Frank H. Trego, research engineer of the Packard company stated that he was about to start a 500-hour test and that he would be glad to get any suggestions from the members present as to what determinations or observations in addition to those ordinarily included in a test of this kind which would be of value. He sketched some curves made from data taken on a recent 351-hour test of a Packard motor running continuously at 1,200 revolutions per minute with wide open throttle. Through one range of about 40 hours during this particular run, the weight of air per cubic foot diminished while the torque remained constant. This was offered as a proof that even with a varying humidity, the engine running was constant.

The question of difference in atmospheric conditions during the daytime and at night was taken up as to its influence, if any, on motor running.

Museum of Safety League Grows

NEW YORK CITY, March 10—More than 175,000 school children of New York City are now wearing the green and red button of the Safety League and a thousand or two more become members of the League every school day. A children's safety crusade has been carried on in New York since last December by the American Museum of Safety with the hearty co-operation of the Board of Education. Its object is street safety for children and the basis of the campaign is daily class-room talks to school children by lecturers from the Museum of Safety, both public and parochial schools being included. These talks are followed by the distribution of pamphlets containing "safety fairy tales," which the children are encouraged to take home and discuss with their parents. Lectures are illustrated by models which enable the speaker to point out graphically the dangers to be encountered in public streets and how to avoid them. To be a full-fledged member of the Safety League all a girl or boy has to do is to put into practice the safety rules and wear the safety button. These badges have the design of a green railroad lantern on red ground, thus carrying out the color scheme of the safety movement—red for danger and green for safety. In many instances children have made the stories contained in the pamphlets the basis of school essays and compositions. Some of the fundamental rules for the children run as follows:

NEVER fail to look both ways for automobiles, trucks and trolley cars before crossing a street. Keep eyes to the left until the middle of the street is reached, then eyes to the right until the curb is reached.

NEVER play any kind of a game in street where automobiles and heavy trucks are constantly passing or in streets where trolley cars are operating.

NEVER hitch on behind a trolley car, automobile or motor truck as you may lose your footing and be thrown under the wheels.

NEVER run pushmobile races in the streets. Pushmobile is hard to stop and may run right in the way of an automobile, heavy truck or trolley car coming in the opposite direction.

NEVER step from behind a trolley car without hesitating and looking as another car may be coming from the other direction.

NEVER take chances.

ALWAYS safety.

Caution and self-control are at the root of the lesson taught; to teach children to take care of themselves and through the children to reach the adults. It is training the children of today to be the prepared workers of tomorrow.

1914 Packard's New "48"



Fig. 1—A unique feature of Packard design which is incorporated in the new 48 is the centralizing control board which is placed on the steering column. The ignition switch is at the front and the light switches, each of which is labeled, are at the left, while the carburetor adjustment is at the right of the board

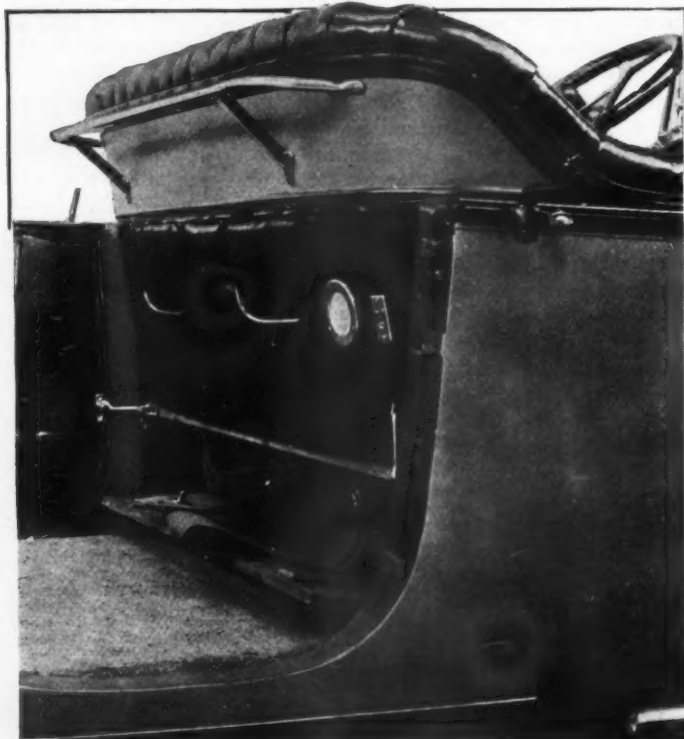


Fig. 2—Rear compartment of the new Packard 48 touring car, showing detailed view of the tonneau and the ample storage space which is provided for side curtains and other impedimenta. The tonneau is roomy and comfortable and all appointments are finely finished

Has Left Drive, Control Centralized on The Steering Column and Combination Electric Lighting and Starting

DETROIT, MICH., March 8—In accordance with its present policy to develop and announce one model of chassis at a time, offering it to the market when ready, as stated in H. B. Joy's recent report of the directors, the Packard Motor Car Co. has just announced another model—the 1914 model 48, six-cylinder type. This new scheme of bringing only one chassis through the factory at a time arises from the fact that the former method of carrying two chassis through the engineering department of two sizes at the same time to be turned over to the manufacturing department together in order to have them ready for the market at the same time, both thus going along together through the shop, has proved unsatisfactory for many reasons, causing delayed deliveries and restricted output.

Summing up the features of the new larger six; it combines the salient features of the 1913 model 48, except that it has left drive, centralized control on the steering column and electric cranking and lighting in combination. These features make the new 48 consistent in design with the smaller six, model 38, which was put before the public last fall.

Control on Steering Column Continued

This control board, Fig. 1 which appeared for the first time last fall as a part of the then new 38, has the ignition switch located at the front and at the left are the various light switches, labeled so as to be readily seen. There are five of these buttons, making it possible to switch on any or all sets of lamps without shifting the driving position. At the right is the carburetor adjustment for varying the ratio of gasoline to air. The box is finished in black enamel, and since its inception has been favorably received by Packard owners.

The first of these new 48's appeared at the New York show. While the same as the model 48's which are now coming through the factory, the car seen at Madison Square Garden was a special job made up to show the public how the car would appear when placed upon the market.

The first demonstrators will be shipped from the factory this week.

In the motor, the only changes over the 1913 model 48 are those brought about by the shifting of the drive to the left side and the centralizing of the control below the steering wheel. The T-head construction with cylinders cast in pairs is retained. Carburetor, magneto and hydraulic governor are placed on the left side, making this now the business side of the power plant. The Delco motor-generator and water pump are placed on the right, the former at the rear, close to the rear support and the latter forward. The timing gears and pump and magneto shaft gears are helically cut and inclosed.

The front end of the motor is hung from an arched cross member of I-beam section, whereas the two rear supports are integral with the upper half of the crankcase, in fact, the careful observer is unable to discover any departures whatever from accepted Packard motor design.

The motor has a bore of 4.5 and a stroke of 5.5 inches, the horsepower by the S. A. E. rating being 48, which gives the model its name. The Packard engineers state that the actual brake horsepower at the same piston speed as that used as a basis for the S. A. E. formula (1,000 feet per minute) is 62

with the muffler on. The maximum is said to be 82 which is at a piston speed of 1,576 feet a minute, or 1,720 revolutions per minute.

The cylinders and pistons are ground and interchangeable, each of the pistons being fitted with two rings. These parts are all lapped together after assembling. The crankshaft has four main bearings supported conventionally by large caps bolting to the upper half of the crankcase. Its diameter is 2 1-4 inches. The valves are of nickel steel.

The electric cranking and lighting combination is too well known and has been commented upon too often in these columns to be taken up in detail here. It is manufactured for the Packard motor by the Dayton Engineering Laboratories Co., and when used for cranking drives through gearing which meshes with teeth cut in the periphery of the flywheel. The unit is normally a generator, being operated by the engine to generate power for the lights and for charging the storage battery which is a part of the equipment. When temporarily a motor for turning the crankshaft, the storage battery returns some of this electric energy to the unit. This battery also assists the generator in supplying the lights when the demand is greater than the amount being generated due to the low running speed of the engine.

To operate the cranking apparatus, it is only necessary to engage the driving gear with the flywheel teeth after the current has been switched on. To assist the cranking mechanism in extremely cold weather, an acetylene primer is included in the regular equipment. The small tank at the right forward side of the running board supplies the acetylene for this purpose.

The current for the ignition system is furnished by a Bosch dual system employing magneto and a storage battery, both of which are entirely distinct from the Delco cranking and lighting system.

Special Carbureter and Governor

The special Packard carbureter operating in connection with a hydraulic governor is retained, though now placed on the left side. The essential feature of this governor is a diaphragm against one side of which the pressure of the water system is directed. The other side connects with the carbureter throttle. The outward bulge of this diaphragm is in proportion to the pressure of the water on the other side, which pressure is, in turn, in proportion to the engine speed. Through its connecting to the throttle, the bulging acts to shut off the fuel somewhat, thus aiding in uniformly governing the engine speed. The advantages claimed for this governor, which is integral with the carbureter on the 48, are that it prevents stalling the motor in

crowded traffic, avoids racing the motor when the clutch is disengaged and affords uniformity of road speeds without requiring skillful use of the accelerator pedal. The carbureter combines float feed with a large cylindrical mixing chamber directly above the aspirating nozzle and automatic mixture regulation for all speeds. The auxiliary air inlet is automatically regulated by a spring-controlled poppet valve, the adjustment of the spring tension of which is accomplished from the control board, Fig. 1. From the control board the primary air intake may also be shut off to facilitate the obtaining of rich mixtures for cold weather starting. The air entering the carbureter is heated by a scoup passing around the exhaust manifold, while the mixing chamber is hot-water jacketed.

Motor lubrication is of the same form as used on the 38. The main system feeds oil directly to the crankshaft, connecting-rods, wrist-pins and motor-gear bearings by pressure from an eccentrically-driven pump. The system also lubricates the intermediate camshaft bearings by spray from the lower connecting-rod bearings. The cylinder walls are lubricated by this spray for light running, but when the motor is under heavy load, an auxiliary system, governed directly and automatically by the throttle, feeds oil directly to the cylinder walls. The crankshaft is drilled to provide an oil passageway. All of the surplus oil eventually finds its way into a reservoir at the bottom of the crankcase, from which point it is re-circulated after being strained. The bottom of the crankcase slopes both ways to form the reservoir, and sediment pockets provided with drain plugs are placed in front and at the rear of the strainer. The normal

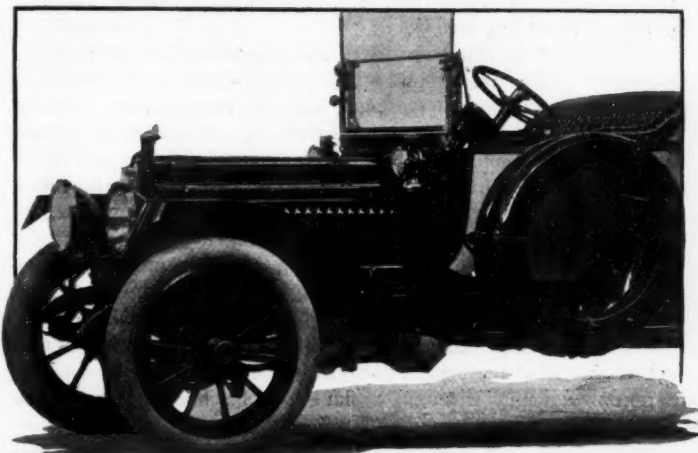


Fig. 3—Fore end of the touring model, showing left drive

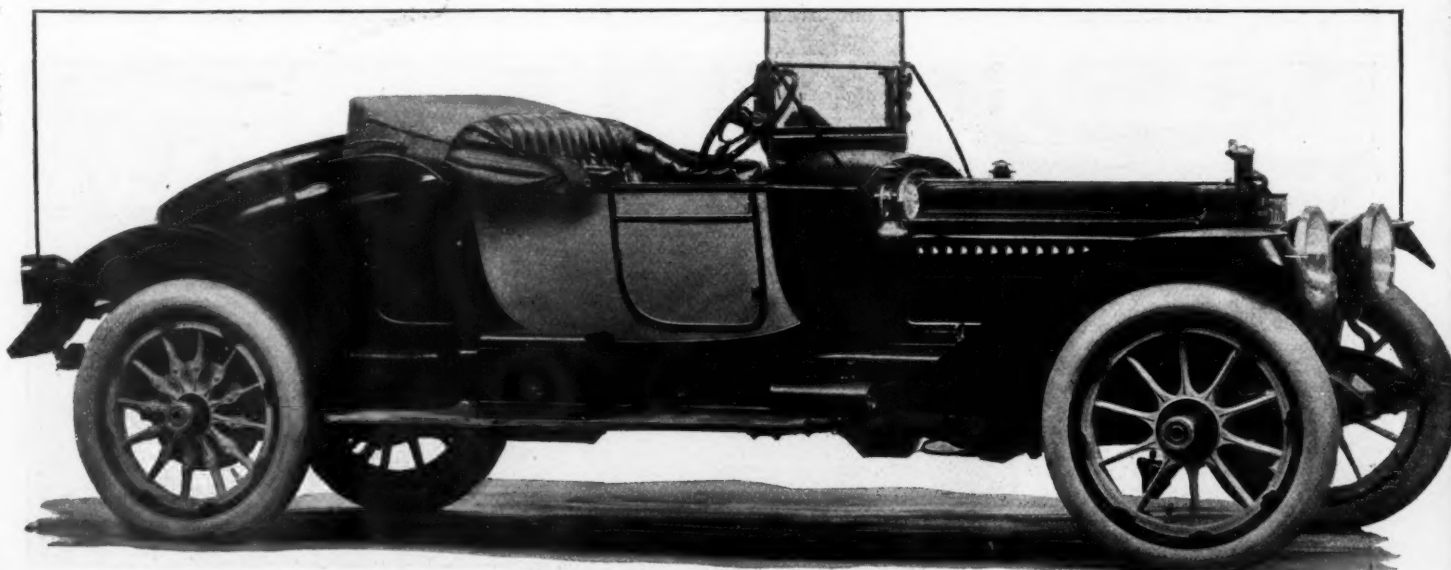


Fig. 4—Packard 48 runabout with body built along phaeton lines—an innovation for the 1913 season

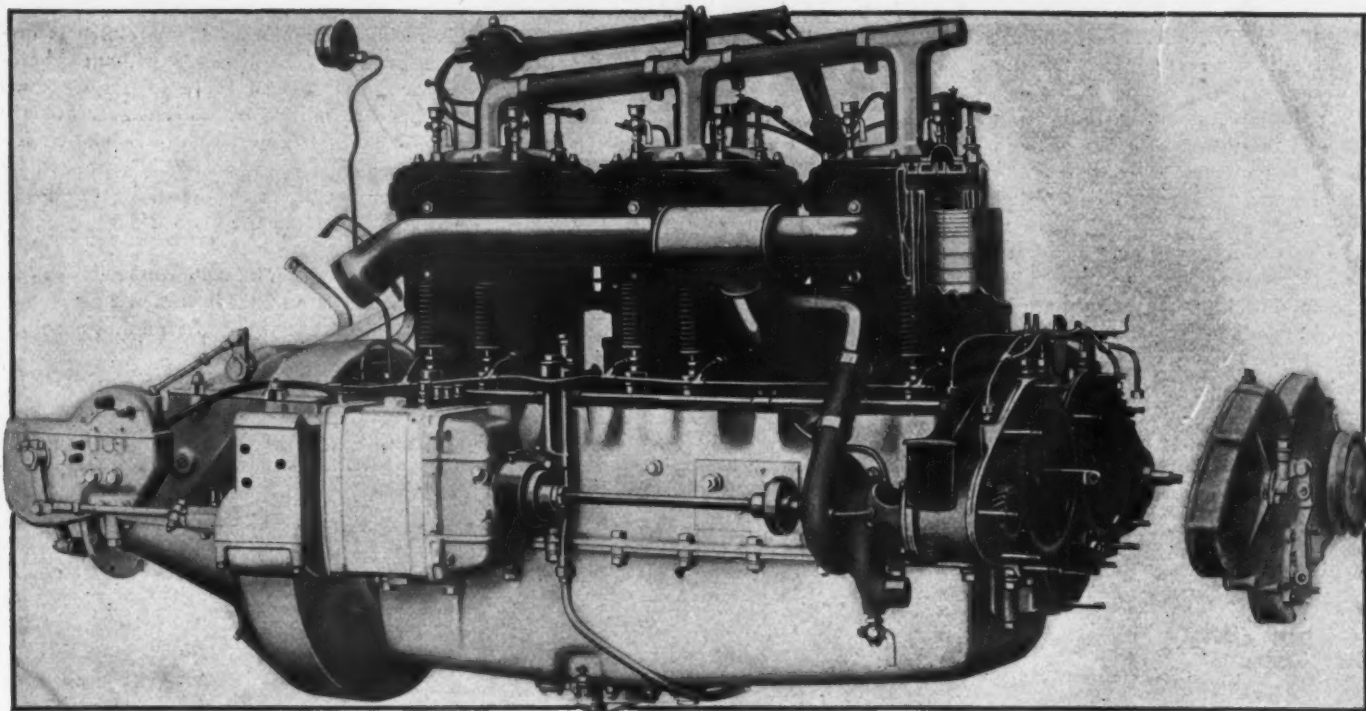


Fig. 5—Showing the new Packard motor with the front cover removed, displaying timing gears

oil capacity is 1 gallon and the oil level is indicated within a gauge glass on the left side.

The dry-plate clutch is used and designed for gradual engagement. The casing plates are faced with friction material, and the shaft plates have plain ground metal faces. An integrally cast rearward extension of the upper half of the crankcase supports the rear clutch shaft, clutch shifter and clutch pedal bearings. This extension also completely houses the clutch in a manner shown in the chassis illustration. To aid in gear shifting, a clutch brake is fitted to the clutch pedal.

Looking at the chassis as a whole, it is seen that the Packard design of two main units remains unaltered. The forward unit comprises the motor and clutch, and the rear one takes in the gearset, differential and final axle drive. The transmission unit reveals no new features. The gearset bolts directly to the differential housing through a flange. The housing for speed change gears, bevel gears and differential are of aluminum, internally ribbed for strength and rigidity. Throughout the transmission, annular ball bearings are used. The rear axle tubes are of large diameter and heavy gauge, pressed into and riveted within flange collars bolted to the housing. The hubs are ribbed

from steel forgings, and the hub flanges are of heavy gauge pressed steel.

There are four brakes, the service being continuous external contracting bands operated by the right pedal. The emergency brakes expand internally. The internal brakes are inclosed and are protected by the drum disks. They are provided with bayonet locks against rattle.

The steering is by worm and nut, the worm and worm shaft being forged integrally with the flange joint. The nut has trunnion disks which operate the yoke. The latter is forged integrally with its shaft, the end of which is squared to receive a heavy ball arm. The steering connecting-rod is so arranged that the car may be turned around in a circle 45 feet in diameter.

The Packard 48 is furnished in three forms—touring, phaeton and runabout. The wheelbase of the touring and phaeton types is 139 inches, while that of the runabout is 121 1-2 inches.

Several new body types have been added to the former wide range of styles in open and closed designs. The phaeton-runabout is a distinctly new style of body which has been added to the open line. It is a rakish body designed to fit the phaeton chassis, thus giving the advantage of the longer wheelbase.

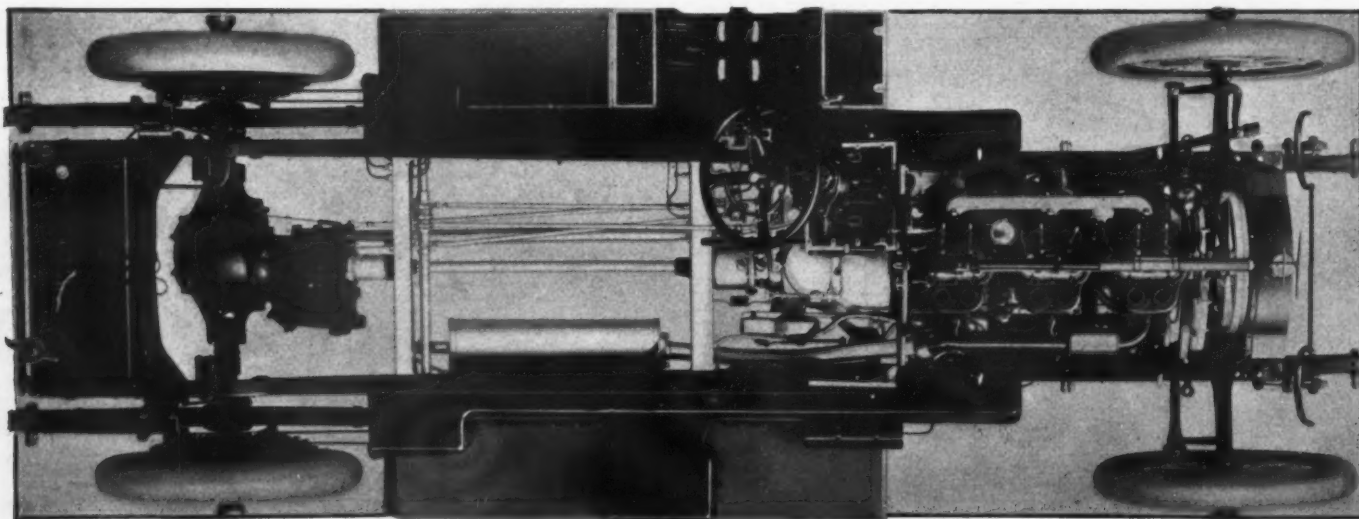
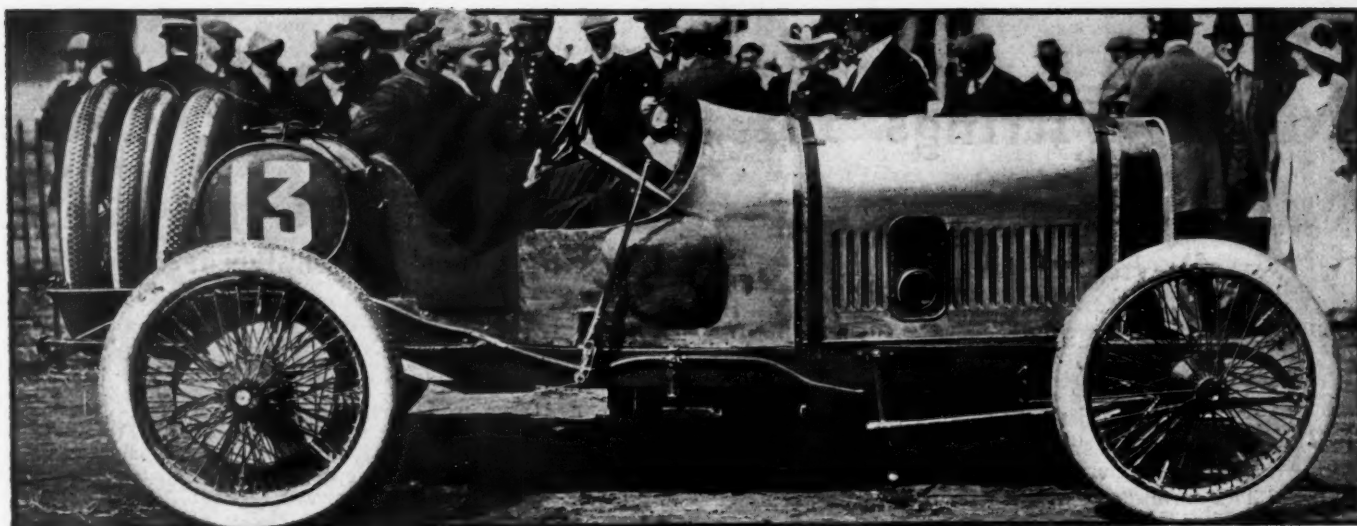


Fig. 6—Plan view of the new Packard 48 chassis, showing mounting of drive and torque members



Jules Goux in the Peugeot which he is to drive at Indianapolis, Ind., in the 500-mile race

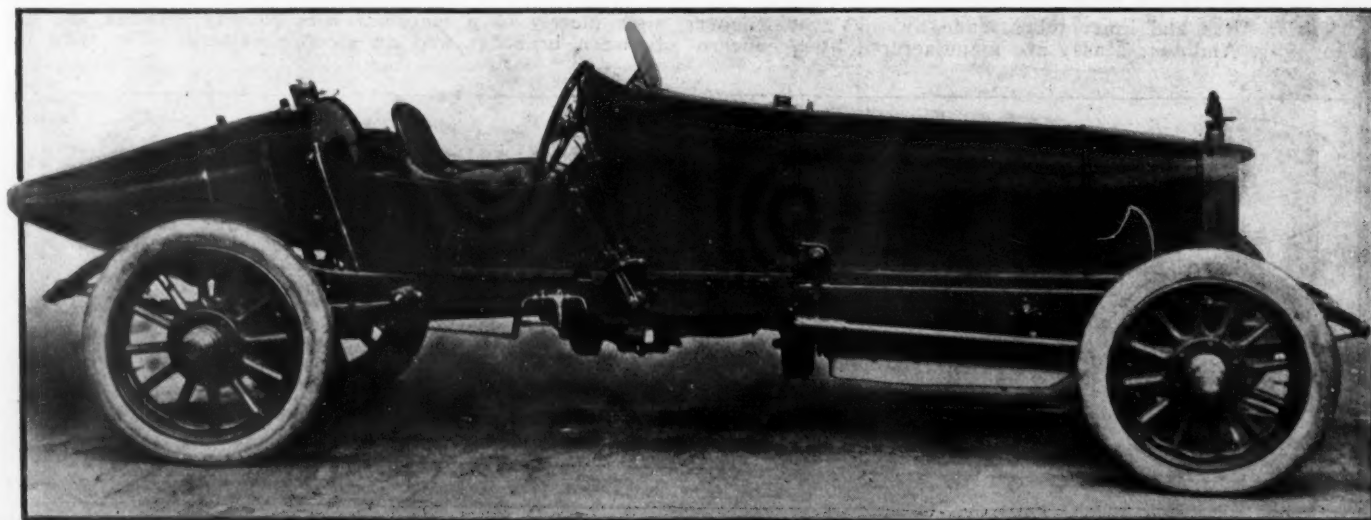
Foreign Drivers Preparing for the 500-Mile Race

PARIS, March 1—Before starting in the French 15-day reliability trial today on a Pierron car, Albert Guyot did a little practising on the six-cylinder Sunbeam entered for the Indianapolis 500-mile race. Guyot declares himself delighted with the car and believes that his rivals will have to possess an unusual turn of speed to keep ahead of the English record-breaker. The car has now been returned to the factory for slight modifications. Since it established its records at Brooklands it has been made several miles an hour faster. Among the new features is a radiator for cooling the lubricating oil. The Sunbeam car has six cylinders in pairs of 3.54 by 6.29 inches bore and stroke, giving a cylinder area of 380.8 cubic inches. The valves are on one side with their stems inclined so as to obtain a more efficient form of combustion chamber. The motor has a force-feed water circulating system, high-tension Bosch magneto and Claudel carbureter. The lubrication is under high pressure to the main bearings and through the hollow shaft to the connecting-rod ends. A large quantity of oil is in circulation and arrangements are provided for cooling it while in circulation. Up to the present this car has always been equipped with Sankkey steel detachable wheels. It is probable that the same will be used at Indianapolis, with Palmer cord tires.

Albert Guyot, who has been selected to drive the Sunbeam, is a Frenchman of 32 years of age whose first important victory

was the winning of the light car Grand Prix at Dieppe, in 1908, on a Delage single-cylinder model. A spectator of Bleriot's flight across the English Channel, Guyot took to flying in 1909 and on August of that year secured his license on a Bleriot monoplane.

To come within the Indianapolis rules, the cylinder bore of the Peugeot racers has been decreased from 110 to 108 millimeters. As their stroke is 200 millimeters, the cylinder area will be very close to the 450 cubic inches allowed under the rules. With the exception of the fitting of the smaller-bore cylinders the cars have undergone very little change. They have overhead valves directly operated by a patented type of camshaft and pushrods placed over the center line and some distance away from the cylinder heads. The cars are fitted with Bosch magneto and Claudel carbureter and have lubrication under very high pressure to all parts. The oil is cooled by deep ribs on the base chamber. A three-point suspended sub-frame carries the motor and gearbox, the final drive being by propeller shaft without the use of radius rods or torque tubes. The cars will be fitted in the race with Rudge-Whitworth wire wheels; the tires have not yet been chosen. At present the gear ratio is 2 to 1. This will doubtless be retained, changes being made on the wheels to get the exact ratio necessary for the track. Jules Goux and Paul Zucarelli will be in charge of the Peugeot pair.



The six-cylinder Sunbeam to be driven by Albert Guyot in the 500-mile race at Indianapolis, Ind.

Many Fittings for Cars and for Drivers

Novelties Seen at the Boston Show—Devices Which Have Not Been Described Previously, and Which Are of Value to Owner, Manufacturer, Garageman and Repairman

Part 1

MANY new accessories have appeared for the first time at the big shows held in New York, Chicago and Boston this year. A number of these have been covered in past issues of THE AUTOMOBILE which dealt with the novelties shown at New York and Chicago. At the Boston show a number of the New England manufacturers displayed accessories which are new to the automobilists.

It is purposed to take up the accessories which seem to have an unusual merit as factors in increasing the comfort or reducing the expense in running an automobile. Most of these accessories appeal to the car owner although there are others which are interesting to the garage keeper. Among the latter are portable tire inflators and jacks which lift the entire end of the car in one stroke.

The following descriptions give a brief outline of the principles involved in each accessory as well as outlining its purpose. It will be noted that the attention of the accessory makers are not confined to one particular line of endeavor nor to the cheaper type of car. Tires, ignition and lighting devices, primers, speedometers, etc., of improved design will be found mentioned in these columns. While many of these have been brought out by new concerns there are several devices which are the outgrowth of similar accessories placed on the market some time ago. Ease of manipulation of tools and legibility in gauges and measuring devices has been made a subject of study by accessory manufacturers.

F. & S. Ball Bearings are characterized by a new retainer. The shape of this retainer and its construction are shown in Fig. 1. It allows the very small space between the balls so that a maximum number of these may be carried in addition to the fact that they are guided perfectly and that there is no possibility of inter-ball contact. A solid-cage construction is used and its form is such that no parts can get between the balls and wedge them in case the cage breaks. The makers claim that, should the cage break, the work of the bearing will not be disturbed. They are imported by the J. S. Bretz Co., New York City.

Tyrian tires and inner tubes made by the Tyer Rubber Company, Andover, Mass., are manufactured by a concern

which has been in the rubber goods business for over 50 years. Casings are made in plain or non-skid tread. The non-skid tread consists of two rows of T-shaped depressions in the tread. These depressions are positioned so that the stems of the T's point toward the hub, one row on the outside of the tire, the other on the side next to the body and a smooth tread strip remaining between them. This style of non-skid carries with it the argument of having sharp edges of rubber to offer resistance to skidding to either side as well as to a circumferential slip. Tyrian casings are built up of Para rubber and Sea Island cotton.

The Expansion tire of the Expansion Spring Rim & Tire Company, Boston, Mass., has an outer shoe similar to the standard pneumatic casing, but instead of using an inner tube filled with air employs what is termed an expansion core supported in conjunction with a crescent-shaped retainer which holds the core outward against the tread portion of the casing. The core is made up of alternate sections of rubber and a non-compressible material. It normally fills not more than one-half of the internal space in the casing, the space occupied being that closest to the tread. In operation the flexible core, in combination with the spring retainer, is looked upon to absorb the jar and it is claimed to distribute this jar around a considerable portion of the wheel periphery.

Bethlehem Five-Point Spark-Plug—The five points of the plug are arranged with one in the center which forms one electrode and the other four distributed in a hollow square about the central point and forming the other electrode. The object of the plug is to prevent carbonization, the use of two of the points at one time allowing the carbon to be burnt out of the other points during that time. Increasing the temperature of an electric conductor also increases its resistance. When two of these points become hot the spark will jump across the coolest gap. The body of the plug is made of Bethlehem steel insulated with German porcelain. A feature of the plug is the distance that the points extend below the body. The plugs are made by Victor G. Goulding, Holyoke, Mass.

Dunn-Ray Lighter—Utilizing a new principle for igniting acetylene lights from the seat, the Dunn-Ray lighter is particularly convenient. Every other device of this type requires a jump or make-and-break spark. This device consists merely of a platinum wire passing through the gap between branches and an electric battery. The wire be-

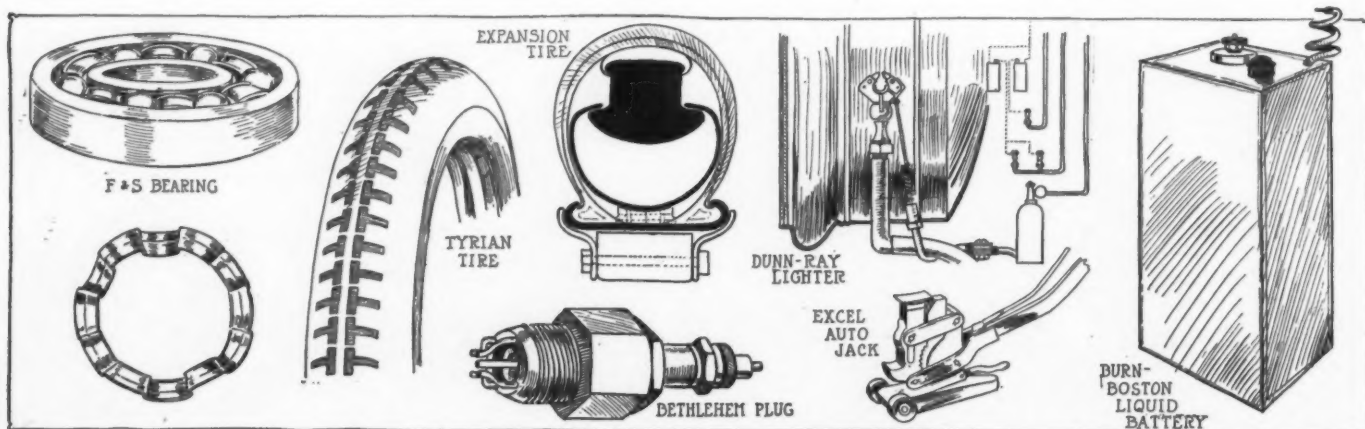


Fig. 1—F and S bearing with new retainer. Tyrian T-tread. Expansion tire. Bethlehem high point plug. Dunn-Ray electric gas lighter. Excel jack. Burns-Boston liquid battery

comes incandescent in about 2 seconds after the switch is thrown on and lights the gas by means of this incandescence. By the aid of the device which is equipped with a controller on the dash the lights may be turned higher or lower from the seat. It is made by the Dunn-Ray Co., Boston, Mass.

The Excel motor jack, built by the Excel Jack Mfg. Co., Boston, Mass., is of the long-handle style, and designed to be used by the operator standing up. In other words, the jack can be positioned under either the front or rear axle and operated without the operator having to assume an impossible position. To facilitate this the pedestal, or stand, is mounted on two wheels at its forward end, these wheels enabling the jack to be readily pushed into any position under the axle. The jack is operated by an up-and-down movement of the handle.

Burns-Boston Battery is a liquid cell using a special form of salt solution electrolyte. The design of the battery is such that rapid circulation is allowed to permit of excessive overload and of obtaining an even distribution of wear through all parts of the current-producing material. The zinc sheet is insulated from the electrolyte and cannot be acted upon by it, except for a pinhole vent. The cell is tightly sealed, thereby doing away with all sources of leakage. The liquid employed in the electrolyte gives forth no noxious gases and is non-freezing. These cells are made by the Burns-Boston Battery and Mfg. Works, Boston, Mass.

Bair Auto Top Holders have been adopted as standard equipment on nineteen important makes of automobiles for the 1913 season. They hold the top tightly in place, keeping the bows separate and tightly in place by a strap and spring. The bows fit into separate notches arranged in a line on the top holder and when clamped in place cannot move. Bair bow hinges are adjustable and can be arranged to bring the top to the desired shape. This is effected by set-screws under each flap. They are made by the Auto Specialties Mfg. Co., Chicago, Ill.

Crankless Gasoline Primer supplies an evaporized mixture of gasoline to a point in the inlet manifold close to the cylinders in order that the motor will respond promptly to the electric starter and reduce the current consumption and wear on the starting device. Besides this its object is to make starting more certain. The crankless primer consists of the valve casing containing two valves. The casing is mounted on the inside of the dash. Projecting on the inside of the dash is a valve stem made of selected Tobin bronze on which is mounted a lock-nut and nickel-plated foot button. Should the starter not operate quickly, the foot button is pressed, allowing a mixture of gasoline and air to be forced into the manifold. As shown in the illustration, Fig. 2, the gasoline is taken from the feed pipe between the carburetor and the tank. The two valves draw in the gasoline and air and a pressure on the button forces the mixture into the manifold. This device is made by the Cox Brass Mfg. Co., Boston, Mass.

The Ingersoll-Sargeant Drill Company, Boston, Mass., has a various line of air compressors for garage use, some of these being air-cooled and others water-cooled. Some types

are stationary and others mounted on three-wheel trucks, on which are also mounted the electric motor for operating the compressor. The motors used in these air compressors are for 110 and 220-volt circuits. They are also made for three-phase, 60-cycle, 110, 220 and 440-volt circuits. The company also furnishes them for single-phase alternating circuits of 110 and 220 volts. These compressors are made with various cylinder sizes, namely 2.5 by 3 inches, 3.5 by 4 inches, 4.5 by 5 inches, and 1 by 1.25 inches. What is known as the Imperial tire pump, is a combined air-cooled single cylinder pump with an electric motor on a three-wheeled truck, has 1 by 1.25-inch cylinder. It operates at 1,700 revolutions per minute, and is claimed to inflate a 35 by 4-inch tire up to 70 pounds pressure in 3 minutes. The Imperial 12 is also a combined pump and motor mounted on a truck. The single cylinder air-cooled motor measures 2.5 by 3 inches bore and stroke. It operates at 450 to 700 revolutions per minute.

Blazer Horn is an exhaust horn for Ford cars and is one of the most simple devices of its kind ever produced. It can be attached by slipping the pipe holding the horn over the end of the Ford exhaust pipe and by connecting with a pedal. It consists of two whistles which are, blown by the exhaust gases diverted by a flap valve operated by a bell crank lever and held in place by a coil spring. As the horn is tilted down it is impossible for it to become clogged, the dirt being shaken out by the vibration of the car. It is made by the Motor Specialties Co., Cambridge, Mass.

The Cataract diagonal block tire for motor trucks differs from other block tires by virtue of the diagonal positioning of the blocks on the rim. The blocks are of such size that upward of a dozen are used to extend around the wheel. They are made in either single or double rows, according to the width required. The blocks are flanged on both sides and have steel trellised bases moulded into the rubber and extending to the extreme edge of the side flanges which secure the blocks in position. The blocks are flanged on both sides in order to fit snugly into the row of steel rims and are also fastened by cross-sectional steel strips with three bolts inserted through the strip and wheel, and tightened by nuts on the inside, this being done to avoid any possibility of creeping and stretching. The diagonal construction is used to eliminate vibration, as with it there are three blocks at a time in contact with the road, and at all other times two blocks carry the weight, in this way making rolling smooth. In case of damage a block is removed as in the various types of block tires now on the market. These tires are made by the Cataract Rubber Co., Buffalo, N. Y.

Standard Speedometer—A new Standard centrifugal speedometer which has made its first appearance at the Boston show indicates the speed by large figures shown at the top of the dial. The slogan adopted by the company in selling this speedometer is "A Figure for Every Mile." The total mileage is shown below the speed dial and below this is the trip mileage. There are two sets to the instrument, first a selective set by which the mileage may be set at any desired point, and second, a zero set by which the mileage is set back to zero. These speedometers are made by the Standard Thermometer Company, Boston, Mass.

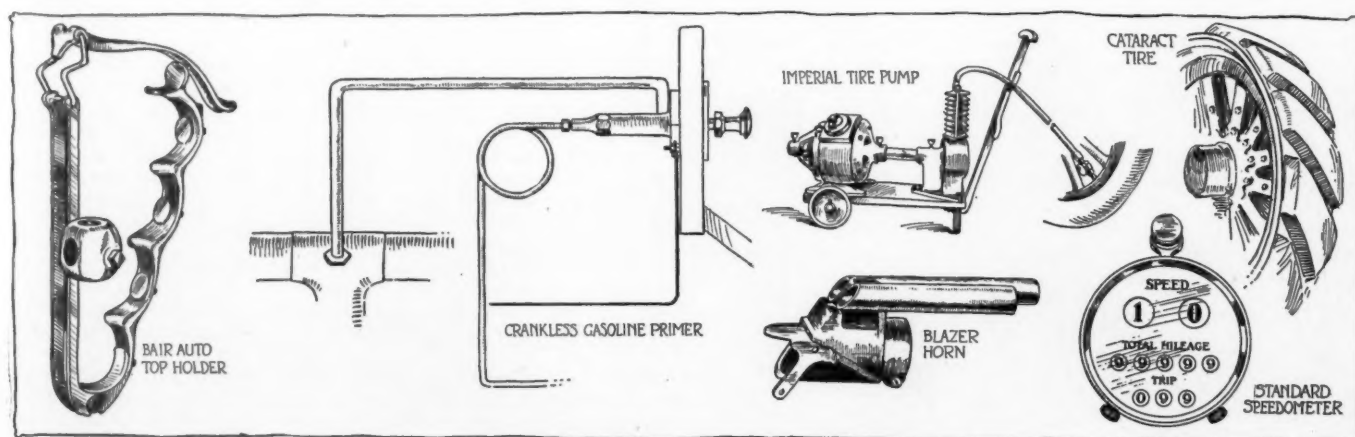


Fig. 2—Bair top holder for top bows. Crankless primer for gasoline. Ingersoll Imperial tire pump. Blazer horn for Ford cars. Cataract diagonal block tire. New Standard speedometer without indicator

Factory Miscellany



Boring machine used in the factory of the Haynes Automobile Co., Kokomo, Ind. It requires only one man to operate it

THE machine shown in the above illustration can do two things. It can bore the cylinders accurately to size and it can face them off. It takes but one man to operate both processes. Time is saved with this machine because it is only necessary to set up the job once for both operations, instead of making two separate settings. The illustration shows the cylinders

in place ready to be worked upon. As may be noted, there are two blocks of cylinders in the machine at one time, so that the time spent upon the work is cut down to its furthest degree. This machine is used in the shop of the Haynes Automobile Company at Kokomo, Ind.

CANADIAN Industry's Growth—Since the first automobile show was held in Toronto, Ont., 8 years ago, automobile factories have been started in seventeen Ontario towns and cities. There are large manufactories in Brantford, Orillia, Brockville, Oshawa, Windsor, St. Catharines, Berlin, Amherstburg, Petrolia, London, Ottawa, Bowmanville, Ingersoll, Guelph, Galt, Walkerville and Kingston. Toronto and West Toronto have several large plants making automobile engines, batteries and other parts.

High Point's Addition—An addition is being erected to the plant of the High Point Motor Co., High Point, Tenn.

Feilbach Buys Site—The Feilbach Motor Co., Milwaukee, Wis., has purchased a site of $5\frac{1}{4}$ acres upon which a new plant will be erected.

Erect Automobile Painting Plant—Ground has been broken by J. W. Schnabel for the erection of a plant for painting automobiles in Greensburg, Pa.

Morgan & Wright Builds—The Morgan & Wright Co., Detroit, Mich., has commenced work on a five-story addition to its plant. It will be 94 feet by 250 feet and will cost \$100,000.

Baldner Contemplates Automobile Plant—The Baldner Automobile Mfg. Co., Xenia, O., recently organized, contemplates the erection of an automobile plant at that point.

Aluminum Goods Company Enlarges—The Aluminum Goods Co., which has plants in Manitowoc and Two Rivers, Wis., will enlarge both this summer. An addition, 100 feet by 20 feet, will be made at Two Rivers.

Dealers Visit Ford Plant—A. H. Smith, manager of the factory sales branch of the Ford Motor Co., Indianapolis, Ind., was recently host for a party of 150 Ford dealers, bankers and newspapermen on a trip to the factory at Detroit, Mich.

Peerless Building Plans Completed—Plans for a five-story brick, concrete and steel truck factory to be constructed in

Cleveland, O., for the Peerless Motor Car Co., that city, have been completed. The plant will cost \$250,000.

Vulcan Plant Started—The Vulcan Mfg. Co., which recently purchased property in Painesville, O., has perfected an organization and will start the manufacture of automobiles. The plant is expected to be finished by July 1 and will employ 150 men.

Standard Adds—The Standard Aluminum Co., of Two Rivers, Wis., will add a large rolling mill this year. An addition, 160 feet by 40 feet, will be erected at once to house the rolling mill equipment. The concern will become a large importer of French aluminum in the raw.

Gray & Davis Building—The Gray & Davis Co., Boston, Mass., has awarded a contract for a factory building to be erected on the Charles River near Cambridge. The contract calls for a five-story reinforced concrete building. The work will be pushed in order to reach completion by July 1.

Factory Office Removed—The factory office of the Pope Mfg. Co., Hartford, Conn., has been removed to the quarters in the west wing formerly occupied by the post office department as a sub-station of the local post office. The space vacated by the factory office will be given up to the factory use.

Republic's Factory Club—The Republic Rubber Co., Youngstown, O., has decided to build a clubhouse for its factory employees, which will be 60 feet by 130 feet in size and made of brick and three stories high. The new clubhouse will be partially under the control of the 1,500 employees of the plant.

Wisconsin Aluminum Builds—The Wisconsin Aluminum Foundry Co., of Manitowoc, Wis., a producer of aluminum castings for the automobile trade, has decided to remain in Manitowoc, the Citizens' Assn. having come forward with a site for the new plant, which will be 200 feet by 75 feet in size, of steel and brick construction.

Dayton Engineering Purchases Factory—The Dayton Engineering Laboratories Co., Dayton, O., has purchased a site and factory building of the Pinneo & Daniels Co., wheel manufacturers, and will maintain a plant on the site in addition to its present one. This company manufactures the Delco self-starting and ignition systems for automobiles.

Mitchell-Lewis Plant Busy—The plant of the Mitchell-Lewis Motor Co. at Racine, Wis., is now operating on a 24-hour schedule, three shifts of men being employed 8 hours a day each. The company some weeks ago started a 20-hour schedule, soon afterward increased this to 22 hours, and now to a full day. Nearly 2,100 men are employed.

Continues Manufacturing Atlas Parts—The Auto Parts and Repair Co., Springfield, O., has leased a portion of the Atlas Motor Car Co.'s factory at that city and will have a full stock of parts of Atlas cars and will repair both Atlas cars and other makes of cars. The company may eventually continue the manufacturing of commercial cars of this type.

Prizes for Republic Employees—In order to insure a greater interest in its product, and to stimulate suggestions for the improvements on machinery and in methods of manufacture, the Republic Rubber Company, Youngstown, O., yearly awards a list of cash prizes. The awards covering the past season were recently made.

Automobile Wheel Factory Coming—A factory for steel automobile wheels will be established in Kansas City, Mo., during the spring by J. N. Carnahan, of Washington, D. C., representing a subsidiary corporation of the Bernsten Steel Wheel Company, Pittsburgh, Pa. An assembling plant is to be opened in April for the manufacture of wheels and automobiles.

Company Moving to Nashville—Nashville, Tenn., has secured an automobile factory, which will be built at a cost of \$200,000 and which will offer employment for 500 men. The new company is the Automobile Manufacturing & Engineering Co., Detroit, Mich., which has been manufacturing the Evans commercial car. The new plant will be of steel and concrete sections, so that the facilities can be readily increased with the growth of the business. The first section will be 60 feet by 200 feet.

Aluminum Castings Wants Site—The Aluminum Castings Co., with headquarters at Cleveland, O., and its principal western foundries at Manitowoc, Wis., is looking for a new location, claiming unfavorable labor and transportation conditions. It is likely that Racine, Wis., will be selected as the site of the new works. The Manitowoc plant is running at a greatly reduced production due to the inability to obtain sufficient labor. This concern manufactures crank-cases and other aluminum castings for many of the large automobile factories of the country.

National Adds to Factory—Another addition has been made necessary at the National Motor Vehicle Co.'s buildings at Indianapolis, Ind. The newest addition is a modern brick and cement building, adding 20,000 feet of floor space and three floors. On the first floor will be a general expansion of machine shops. On the second floor will be an enlargement of the painting department. The top floor will be an enlargement of the trimming and upholstering departments and has been especially arranged so as to afford exceptional good light and ventilation.



Shows, Conventions, Etc.

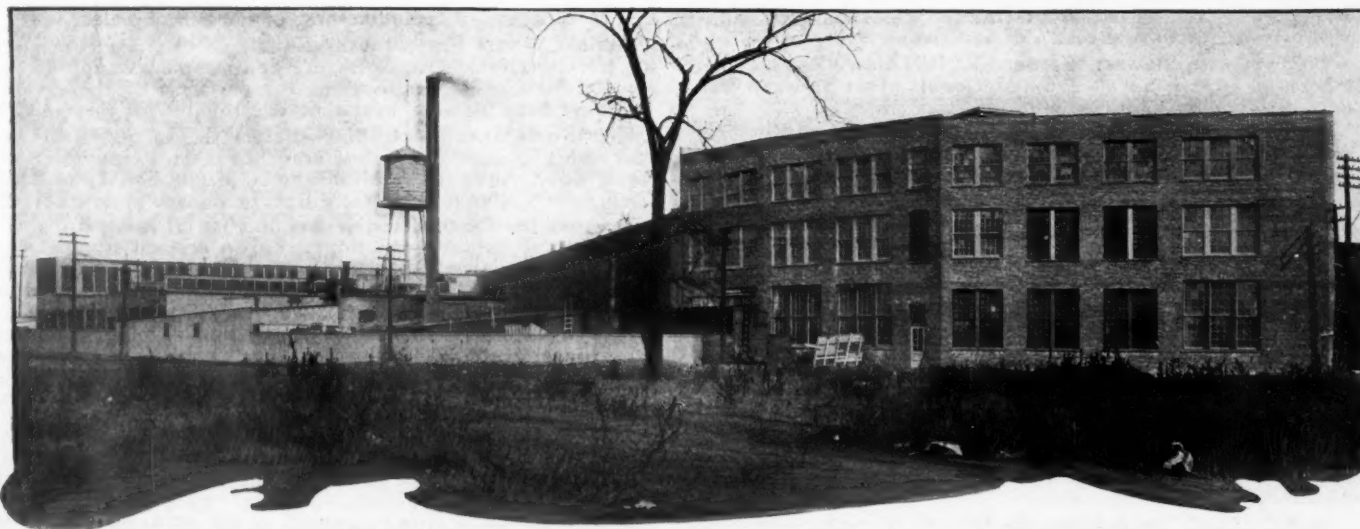
- March.....Indianapolis, Ind., Spring Automobile Show, State Fair Grounds, Indianapolis Automobile Trade Association.
- March.....Nashville, Tenn., Annual Show, Nashville Automobile Dealers' Association.
- March 8-15.....Boston, Mass., Annual Automobile Show.
- March 8-15.....Columbus, O., Annual Show, Billy Sunday Tabernacle, Automobile Club and Traders' Association.
- March 10-15.....Columbus, O., Opening Week, Columbus Automobile Trades Association.
- March 11-15.....Buffalo, N. Y., Commercial Vehicle Show, Auditorium, Automobile Dealers' Association.
- March 12-15.....Ogdensburg, N. Y., Automobile Show, Louis Blumenstein, Manager.
- March 17-22.....Norfolk, Va., Annual Show, Armory Building, Norfolk Automobile Trade Association, Inc.
- March 19-22.....Springfield, Ill., Annual Show, Springfield Commercial Association, W. L. Chapin, Mgr.
- March 19-26.....Boston, Mass., Annual Truck Show.
- March 20-24.....New Orleans, La., Annual Show, N. O. A. D. A.
- March 24-29.....Indianapolis, Ind., Annual Automobile Show.
- Mar. 27-April 3.....Quincy, Ill., Mississippi Valley Automobile Show, H. F. Hofer, Director.
- March 31-April 5.....Manchester, N. H., Automobile Show, Dealers' Association, J. H. Graham, Manager.
- April 1-6.....San Francisco, Cal., Motor Truck Show, Coliseum Hall, Motor Field.
- April 5-19.....Pittsburgh, Pa., Annual Show, East Liberty Market House, Dealers' Association.

Race Meets, Runs, Hill Climbs, Etc.

- May 30.....Indianapolis, Ind., 500-Mile Race, Speedway.
- July 1.....Indianapolis, Ind., Tour of Indiana Automobile Manufacturers' Association to the Pacific Coast.
- July 1-16.....Winnipeg, Man., Motor Plow Competition, Dr. A. W. Bell, Manager.
- July 8-16.....Winnipeg, Man., Midsummer exhibition, A. C. Emmett, Manager.
- July 27-28.....Tacoma, Wash., Tacoma Road Races.
- Nov. 24.....Savannah, Ga., Vanderbilt Cup Race, Motor Cups Holding Company.
- Nov. 26.....Savannah, Ga., Grand Prize Race, Automobile Club of America.

Foreign

- March.....France, Sealed Bonnet, 3000-Mile Run.
- March 31.....Montevideo, Uruguay, International Competition of Agricultural Motor Vehicles.
- April.....Barcelona, Spain, International Exhibition.
- May.....St. Petersburg, Russia, International Automobile Exposition, building of Michael Manere, Imperial Automobile Club of Russia.
- July 12.....Amiens, France, Grand Prix Race.



Showing a recent addition which allows 20,000 feet of floor space to the National Motor Vehicle Co., Indianapolis, Ind.

News of the Week Condensed



Daily scene in front of the Studebaker Corporation's plant 1 in Detroit, Mich. Every Detroit juvenile hopes to grow up to be a tester

AUTOMOBILES in Australia—There are about 135 automobiles in use in the Newcastle district, Australia, about 75 per cent. of which are runabouts, usually of 20 to 30 horsepower and four cylinders, selling at \$1,000 to \$1,200. Touring cars sell for \$1,800 to \$2,500, but the market for high-priced cars is very limited and is practically confined to European makes. Medium and low-priced cars are meeting with a good sale, and about 50 per cent. of this grade of cars in use are American. As the climate is semitropical the extra air pipe, besides the water-cooling device, is in general use.

Ogdensburg Holding Show—Ogdensburg, N. Y., is holding its annual automobile show this week.

Beyer Resigns—E. C. Beyer, manager of the Mitchell Motor Co., Kansas City, Mo., has resigned.

Bregstein Opens Supply House—C. Bregstein recently opened a supply house in New York City.

Inspector General Now—H. G. Harper has been appointed inspector general of the Studebaker Corporation's automobile division, Detroit, Mich.

Venice Purchases Pope Truck—The city of Venice, Cal., has purchased a 3-ton Pope-Hartford motor truck which will be used for the collection of garbage.

Baldwin with Stewart-Warner—R. H. Baldwin has accepted a position as assistant to E. W. McGookin, of the Stewart-Warner Speedometer Corporation, in Detroit, Mich.

Workman President—The Fargo Automobile Retail Dealers' Association, Fargo, N. D., has elected W. H. Workman president of the association for the ensuing year.

Jewell Sales Manager Kelly—W. S. Jewell has been appointed sales manager of the Boston, Mass., branch of the Kelly-Springfield Motor Truck Co., Springfield, O.

Schwitzer Columbia Chief Engineer—Charles Schwitzer has been appointed chief engineer of the Columbia Motor Car Division, Hartford, Conn., of the Maxwell organization.

In New Quarters—The E. V. Stratton Co., Albany, N. Y., Hudson and Stewart distributor for eastern New York, has leased for a term of years the premises now occupied by C. S. Ransom on Chapel street.

Garabrant Franklin Sales Manager—W. W. Garabrant has been appointed Franklin district sales manager for the states of Nebraska, Kansas, Missouri and Oklahoma. His headquarters are at Kansas City, Mo.

Buffalo Sends Delegation—Buffalo, N. Y., will send a big delegation to Albany at the hearing before the internal affairs

committee of the Senate and the Assembly in regard to numerous bills affecting automobilists.

Denniston Appointed Manager—E. E. Denniston, Buffalo, N. Y., has been appointed manager of the truck sales department of J. A. Cramer, that city. Mr. Denniston will have sale of Federal, Jeffrey and Standard trucks.

Automobile Line Possible—There is talk of establishing an automobile line from Monessen, Pa., to Charleroi with a 5-cent fare. The cars will seat forty people, will be lighted by electricity and made in every way comfortable.

Truncer Garage in Bankruptcy—E. C. Truncer, proprietor of the Northern Garage, filed a petition in bankruptcy in Buffalo, N. Y., his liabilities being \$1,358.35 with assets totaling \$87.90, of which \$60 worth of clothing is exempt.

Inner Liners Manufactured—The Hampton Manufacturing Co. has been organized at Indianapolis, Ind., to manufacture inner liners for tires. Those interested in the company are Simon B. Nussbaum, Samuel Rubens and M. Moskin.

Little Sales Manager Borland—W. C. Little has severed his connection with the Lozier Motor Co., of Detroit, Mich., to accept a position as sales manager of the Borland-Grannis Co., of Chicago, Ill., manufacturer of the Borland electric.

Buffalo Wants Fire Trucks—Buffalo, N. Y., is in the market for two city service motor fire-fighting trucks and one automobile truck. Appropriations for purchase of these vehicles have been included in the city's estimates for this year.

New Studebaker Salesrooms—Before the spring is far advanced Studebaker automobile branches in St. Louis, Mo., Atlanta, Ga., Omaha, Neb., Minneapolis, Minn., Salt Lake City, Utah, and Washington, D. C., will all be housed in new homes.

Automobile Transportation Building at 'Frisco—An automobile transportation building is to be erected by the National Association of Automobile Manufacturers at San Francisco, Cal., for the Panama-Pacific International Exposition to be held in 1915.

Internal Combustion Engine Exposition—The first annual exposition of internal combustion engines, under the auspices of the College of Engineering and Department of Agricultural Engineering of the University of Wisconsin, Madison, Wis., was held for four days recently.

New Hartford Dealers Association—Plans are under way for the formation of a new dealers association in Hartford, Conn. Due to a ruction by two business rivals in the organization a few of the members resigned. As a result it is understood that most of the members of the old association will resign from that and join the new.

New Agencies Established During the Week

PLEASURE CARS

Place	Car	Agent
Athens, Ohio.....	Marathon	George Moon
Buffalo, N. Y.....	Rambler Cross Country	J. A. Cramer
Buffalo, N. Y.....	Merced	Ralph E. Brown Co.
Buffalo, N. Y.....	Rambler	J. A. Cramer
Chicago, Ill.....	Keeton	J. A. Bender Co.
Columbus, O.....	Marathon	Pausch & Selbach Wagon & Auto Co.
Des Moines, Iowa.....	Apperson	Hawkeye Auto Co.
Des Moines, Iowa.....	Midland	Bernhard & Turner
Dunnell, Minn.....	R-C-H	Cooper & Chute
Glassport, Pa.....	R-C-H	R-C-H Auto Co.
Indianapolis, Ind.....	Mitchell	B. M. Wiley
Kansas City, Mo.....	Keeton	H. A. Dougherty
Los Angeles, Cal.....	Case	Case Auto Sales Co.
Louisville, Ky.....	Chevrolet	Reimers Motor Car Co.
New York City.....	Apperson	Shepherd Auto Co.
New York City.....	Haynes	Geo. M. Redding
Pendleton, Ore.....	Paige	Long Bros.
Philadelphia, Pa.....	Edwards-Knight	Gregg-William D. Rogers Co.
Philadelphia, Pa.....	McIntyre	Philadelphia McIntyre Auto Co.
Republic, Ohio.....	Paige	Womer & Ink.
Roseland, Ill.....	Franklin	D. Van Wyngarden
South Bend, Ind.....	R-C-H	A. J. Diemeyer
Spokane, Wash.....	Paige	Consolidated Auto Co.
St. Louis, Mo.....	Empire	M. W. Bond Automobile Co.
St. Louis, Mo.....	Marion	Marion Motor Sales Co.
St. Louis, Mo.....	Midland	American Welding & Auto Repair Co.
St. Louis, Mo.....	Mogul	Mogul Motor Truck Co. of St. Louis

Place	Car	Agent
Syracuse, N. Y.....	Sanford	A. A. Ledermann
Tacoma, Wash.....	Paige-Detroit	Pacific Car Co.
Troy, N. Y.....	Hudson	William D. Paine
Troy, N. Y.....	Stewart	William D. Paine
Walla Walla, Wash.....	Paige	W. J. McCormack
Washington, D. C.....	Abbott-Detroit	David S. Hendrick Co.
Washington, D. C.....	Case	J. L. Creyke
Washington, D. C.....	Franklin	David S. Hendrick Co.

COMMERCIAL VEHICLES

Albany, N. Y.....	Stewart	Albany Garage Co.
Akron, O.....	Stewart	Middlebury Garage
Atlantic City, N. J.....	Stewart	Eastern Motor Co.
Buenos Ayres, Argentine.....	Stewart	Pratt & Co.
Calgary, Alta.....	Stewart	Motor Power & Transit Co.
Fall River, Mass.....	Stewart	Robt. W. Powers
Grand Rapids, Mich.....	Stewart	The Overland Co.
Hartford, Conn.....	Stewart	Capitol City Auto Co.
Indianapolis, Ind.....	Federal	McFarlan Six Sales Co.
Los Angeles, Cal.....	Stewart	Stewart Auto Sales Co.
Medford, Mass.....	Stewart	Ross Maddocks
Medicine Hat, Alta.....	Stewart	Medicine Hat Garage
Montreal, Canada.....	Stewart	Ralph Careu
Newark, N. J.....	Stewart	Edward McK. Hunt
Pittsburg, Pa.....	Stewart	Alco Pittsburg Sales Co.
San Francisco, Cal.....	Stewart	S. G. Chapman
Washington, D. C.....	Stewart	David S. Hendrick Co.
White Plains, N. Y.....	Stewart	Chas. F. Brown

ELECTRIC VEHICLES

Indianapolis, Ind.....	Ohio	Ohio Electric Sales Co.
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Add Motor Fire Equipment—Glendale and Bakersfield, Cal., have recently added motor equipment to their fire departments.

Higher License Rate—Talk of a higher license rate in New Orleans, La., has raised a determined protest from owners and dealers.

Benson Vice-President—E. R. Benson of the Studebaker Corp., Detroit, Mich., has been appointed vice-president of that company.

Large Californian Registration—Twenty-six thousand and four automobiles were registered by the secretary of state of California in February, 1913.

Pritchards Sales Manager—T. B. Pritchards has been appointed sales manager for the V. S. Bringham Motor Car Co., Cadillac agents in Seattle, Wash.

Bailey Goes to Goodyear—I. R. Bailey has recently been appointed manager of the mechanical goods department of the Goodyear Tire & Rubber Co., Akron, O.

Firestone Branch Moves—The San Francisco, Cal., Firestone tire branch recently moved to new quarters at Van Ness avenue and Bush streets with W. M. Bell, manager.

KisselKar Agency Transferred—The Philadelphia, Pa., agency of the KisselKar has been transferred from C. H. Miller to C. H. McCausland, with J. J. Kane, Jr., as the new manager.

Suydan Goodyear Manager—James Suydan, manager of the St. Paul, Minn., branch of the Goodyear Tire & Rubber Company, Akron, Ohio, has been appointed manager of the Wisconsin, Wis., branch.

Bus Line Established—An automobile bus line has been established between Santo Domingo and San Geronimo. The same conveyances make trips to portions of the capital of the Dominican republic.

MacDonald Entertains Successor—Former highway commissioner J. H. MacDonald, of Connecticut, entertained his office associates and his successor in office, C. J. Bennett, at the Hotel Garde, Hartford.

Good Roads More Purchases—Recent improvements of the streets of Port au Prince, Haiti, has resulted in the purchase of ten pleasure cars and one truck. A rapid increase in the number of cars is expected.

Case Opens Branch House—The J. I. Case T. M. Co., Racine, Wis., recently opened its new branch house at Milwaukee, Wis., devoted exclusively to its automobile interests in the eastern half of Wisconsin.

Many Good Roads Bills—Twenty-one separate bills for new main highway routes, in addition to those included in the act of 1911, have been introduced into the present legislature in Pennsylvania and are in the hands of the public road committee of both houses awaiting action.

Reorganize Alco Sales Forces—Leigh Post, one of the vice-presidents of the American Locomotive Co., Providence,

R. I., has been made head of the automobile department, and will have complete charge of the company's production and marketing of automobiles.

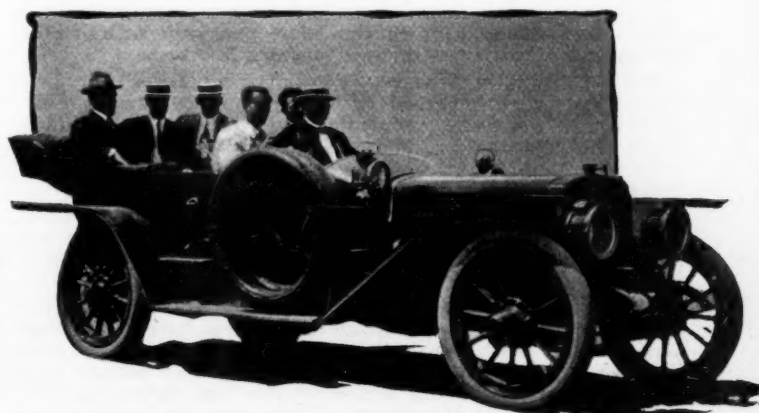
President Wilson Uses Horses—Contrary to expectations, President Wilson did not make appearance in the parade down Pennsylvania avenue after taking the oath of office in an automobile. Instead he and former President Taft used a large carriage pulled by four horses.

Buenos Aires' Automobile Driveway—A contract has been let by the municipal government of Buenos Aires, Argentina, providing for the construction of an asphalted automobile driveway along the Rio de la Plata, in front of the city. The work calls for the expenditure of \$1,255,000.

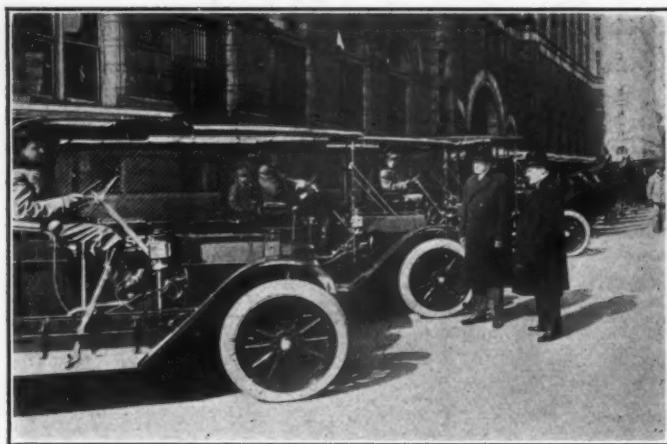
Reynolds with New Company—E. W. Reynolds, the founder of the E. W. Reynolds Co., of Omaha, Neb., and who some time ago disposed of his holdings in that concern, has been made manager of the top department of the Western Auto Sales and Manufacturing Co., that city.

Gettysburg Taxies Taxed—By a decision of the Supreme Court the borough of Gettysburg, Pa., is now able to enact and put in operation an ordinance taxing automobiles which are used for hacking purposes on the battlefield, and the town council will likely pass such a measure in time for the coming celebration in honor of the fiftieth anniversary of the battle to be held July 1 to 4.

Club's Secret Service Bureau—In putting into effect its secret service bureau the Columbus, O., Automobile Club has a unique idea which so far has been quite a success. The club has employed a detective bureau to take care of all thefts of cars or contents from club members without any cost excepting the necessary transportation charges when the detectives are called out of the city.



President Woodrow Wilson and a party of friends in a Lozier six, near the Wilson home, Sea Girt, N. J.



An interesting occasion. Postmaster-General Hitchcock and Postmaster N. A. Merritt, of Washington, D. C., inspecting the equipment of the Washington office. At the left, under the inspection of the two officials, are the KisselKars used in parcel post work.

Elmira Goodyear Agency—The Elmira Arms Company, Elmira, N. Y., has secured the agency for Goodyear tires.

Holds Speeding as Negligence—In New Jersey violation of the automobile law is evidence of negligence and may be so considered in an accident trial.

New Factory Branch—The Krit Motor Car Co., Detroit, Mich., has established a direct factory branch in Kansas City, Mo., with G. V. H. Cairns as manager.

Buick Garage Buys Property—The Buick Carage Co., Hartford, Conn., has acquired the Atterbury Garage and will remove the taxicab business to that place.

Martin Sales Manager—F. H. Martin has been appointed Eastern sales manager for the Stewart-Warner Speedometer Corp., Chicago, Ill., with headquarters in New York City.

Swinscoe Changes Position—The Weston-Mott Co., Flint, Mich., has secured the services of John Swinscoe, formerly chief engineer of Driggs-Seabury Ordnance Corp., Sharon, Pa.

Reilly Moline Manager—C. R. Reilly has been appointed manager for the Minneapolis, Minn., branch of the Moline Automobile Co., Minneapolis, Minn., to succeed W. J. Lawrence.

H. M. S. Company Formed—The H. M. S. Motor Co., New York City, recently incorporated, will deal in trucks, build bodies and repair and paint them. It is incorporated for \$22,500.

Austin Studebaker Engineer—J. C. Austin, formerly chief engineer at the Regal Motor Car Co., Detroit, Mich., is now engineer of passenger cars under Chief Engineer J. G. Heaslet of the Studebaker Corp., Detroit, Mich.

Baker Manager on Jaunt—G. H. Kelly, manager of the truck department of the Baker Motor Vehicle Co., Cleveland, O., has started on an extensive Western tour in the interests of big business and service developments.

Firestone Acquisitions—G. J. Bates has recently connected with the Firestone Tire and Rubber Co., Akron, O., having charge of the sales in the pneumatic tire department. R. G. Harris has recently joined the same company as assistant advertising manager, with headquarters in Akron.

Hudson Donates \$100,000—The Hudson Motor Car Co., Detroit, Mich., has agreed to donate \$100,000 for the construction of the trans-continental stone road, the conditions being the same as in the case of the Packard and Willys donations.

Bellmore Armored Claimed Bankrupt—Three claims totaling \$569.23 are the basis on which the Bellmore Armored Car & Equipment Co., New York City, is claimed to be insolvent. The application for involuntary bankruptcy was filed on February 26.

Chauffeurs Undergo Physical Examination—Applicants for chauffeurs' licenses in New Orleans, La., will have to undergo a physical examination in the future. Special attention will be given vision. No license will be issued to a person who is color blind or who has any other defect in sight.

New Chauffeurs' Organization—The Capital City Society of Automobile Engineers is a new chauffeurs' organization with seventy-five members in St. Paul, Minn. The society is formed to give chauffeurs opportunity to discuss autom-

bile problems and proper care of them, and to furnish a reference to accredited chauffeurs to car owners.

Supply Dealers Organize—The Omaha, Neb., Automobile Supply Jobbers Credit Association was recently organized with C. G. Powell as president. The purpose of this association is to advance the interests of automobile supply dealers throughout the Omaha territory, investigate and regulate prices and in general work for better conditions in the trade.

Chalmers to Issue \$1,500,000—With the consent of the majority stockholders, the Chalmers Motor Co., Detroit, Mich., is preparing to issue \$1,500,000 in prepared stock through the banking firm of Spencer Trask & Co., bankers, New York City. The issue will permit the company to take up the floating indebtedness and will provide ample ready working capital, so that it will not be necessary to seek periodic accommodations from the banks.

Total Production Crude Oil—The total production of crude oil in the year 1911 was 220,000,000 barrels. The total production in the year 1912, as far as this can be gathered from reports at the present, will be somewhat less. The total production for the year 1910 was approximately 200,000,000 barrels. The gasoline producing crudes in 1910 figured 126,000,000 barrels; in 1911, 127,000,000, and in 1912, 124,000,000, approximately.

U. S. Interested in Tour—The United States Government has been asked to take an interest in the big pathfinding tour which the Indiana Automobile Manufacturers' Association is promoting for the proposed trans-continental stone automobile road. Permission has been requested to send a company of infantry on the tour, the soldiers to ride in a fleet of five motor trucks as a demonstration of the possibilities of this method of transportation for the army.

Automobile Insurance Barred—The Iowa Supreme Court has held that under the Iowa laws an insurance company cannot write insurance against personal injury damage cases growing out of automobile accidents. The insurance department held that such insurance was not covered by the laws, while the attorney general held that it was against public policy. The decision says that special legislation will be necessary to legitimize this class of insurance.

Automobile Incorporations

AUTOMOBILES AND PARTS.

CHARLESTON, S. C.—Only Automobile Co.; capital, \$200,000. Incorporators: Santo Sottile, M. R. Rivers, Lawrence M. Pinckney.

CHARLOTTE, VA.—Lyerly Motor Company; capital, \$15,000; to do a general automobile business. Incorporator: D. K. Lyerly.

CINCINNATI, O.—Fred M. Ross Spring Wheel Co.; capital, \$100,000; to manufacture and deal in hubs and wheels for automobiles. Incorporators: Theodore Horstman, Fred M. Ross, W. W. Baxter, Horace Horstman, Otto Huber.

CLEVELAND, O.—Cleveland Motor Trucking Co.; capital, \$10,000; to do a general trucking business with motor propelled vehicles. Incorporators: J. Chas. Ross, C. B. Goetzfried, C. A. Cochran, Robert W. Blake, Henry Eckhoff.

INDIANAPOLIS, IND.—Capitol Vody Co.; capital, \$10,000; to manufacture metal automobile bodies. Incorporators: Elmer Hinshaw, Fred W. Henschen, Elmer W. Hughey, W. A. Lyons, R. Coghill.

MOUNT VERNON, N. Y.—Motor Truck Mfg. Corp.; capital, \$150,000; to manufacture engines, machinery. Incorporators: Arthur J. Albert, Louis Bertsch, Henry Hilchenbach.

NEW YORK, N. Y.—American Truck Co.; capital, \$3,000,000; to manufacture, sell and deal in automobiles, motor trucks, etc. Incorporators: Joseph F. Curtin, H. O. Coughlan.

NEW YORK, N. Y.—Veerac Motor Truck Co.; capital, \$10,000. Incorporators: Harry B. McGinley, Edward L. Whittemore, George H. Hinnau.

RAVENNA, O.—Ravenna Motor Truck Co.; capital, \$200,000; to manufacture and sell self-propelled vehicles. Incorporators: W. F. Travos, A. N. Knuth, H. Schwartz, L. N. McKenzie, C. O. Liggett.

ROCHESTER, N. Y.—Carthage Auto Co.; capital, \$5,000; to deal in motor vehicles. Incorporators: Frederick V. Kuhnert, Arthur W. Alderman, Chas. L. Pierce.

ROCHESTER, N. Y.—Rochester Automobile Exchange; to do a general automobile business. Incorporators: Ezra J. Beller, Bertram E. Wilson, W. Hayes Mitchell, Owen D. DeWitt.

WAYNESBORO, VA.—Waynesboro Automobile Co.; capital, \$15,000. Incorporators: B. E. Watson, J. B. Young, H. M. Hanger.

GARAGES AND ACCESSORIES

ANDERSON, IND.—Pierce Speed Controller Co.; capital, \$25,000; to manufacture speed indicating and controlling devices. Incorporators: George W. Pierce, F. F. Mustard, U. M. McCullough.

BALTIMORE, MD.—Dreadnaught Tire & Rubber Co.; capital, \$1,000,000; to manufacture automobile tires. Incorporators: A. F. Gilbert, Wilmer Dunbar, Walter E. Hill, C. P. Triplett.

BEDFORD, O.—Bedford Motor Bus Co.; capital, \$10,000; to operate a motor bus line. Incorporators: Michael Wallner, Albert E. Smith, C. K. Brock.

CANTON, O.—Harper Tire & Rubber Co.; capital, \$400,000; to manufacture and deal in automobile tires. Incorporators: Warren D. Harper, James Thomas, Albert H. Vayo, Byron B. Vaughan, Carroll Brady Bour.

Ford Adds to Establishment—The Ford Motor Co., Vancouver, B. C., has added to its establishment, a spare parts department. It has parts enough to build about forty cars.

Fire Destroys Walkerville Garage—Fire destroyed the garage of the American Auto Trimming Co., and caused a damage of more than \$7,000, only part of which was covered by insurance.

San Marcos' Passenger Service—An automobile passenger service has been established between San Marcos and Luling, Tex., by Merritt & Wills. Daily trips will be made between the two towns.

Oshkosh Buying Fire Truck—The city of Oshkosh, Wis., has awarded the contract for a combination hose and chemical car for the fire department to the F. S. Hoaglin Automobile Co., that city, at \$3,500.

Transfers Salesrooms—King & McDonnell, Sacramento, Cal., have transferred their salesrooms to the old Lutheran Church building at the corner of Twelfth and K Streets. They handle Michigan cars.

Banquet for Show Committee—Active, associate and contributing members of the Philadelphia, Pa., Automobile Association, recently tendered a banquet to the 1913 automobile show committee, as an appreciation of the committee's efforts in the success of the recent show.

Rubber Goods Declares Dividend—A regular quarterly dividend of 1 3/4 per cent. on the preferred stock and 6 per cent. on the common stock has been declared by the Rubber Goods Mfg. Co., of New York City, both payable on March 15 to stockholders of record on March 10. The common dividend is the same as was declared last year at this time.

Baltimore to Spend \$50,000—The city of Baltimore, Md., plans to spend \$50,000 this year to motorize municipal departments. Chief among these will be the conversion of ten hose wagons into automobiles, trucks for street cleaning department and park board and runabouts for the eight district engineers of the fire department, the superintendent of street lighting and the electrical engineer.

Opposed to Toll Reduction—Contending that a reduction of tolls over the Connecticut River bridge at Lyme and Old Saybrook would materially reduce revenue, the bridge com-



The way icy weather drives the horses to the blacksmiths' shops. A scene in Cleveland, O., during a recent cold spell. Its significance to the motor truck manufacturer appealed to one of the officers of the Mora Power Wagon Co.

missioners are opposed to any such proposition as has been agitated of late. Mr. Haynes, who introduced the bill, claims that if the tolls were reduced there would be an increase in traffic with consequent gain in tolls.

Opportunities in Foreign Markets—A foreign city has appropriated \$14,280 for the purchase of four motor ambulances. File No. 10,269. A municipality in South America desires to purchase two automobile ambulances, fully equipped, and two motor buses, capable of carrying 24 soldiers. A merchant in the same city wants to hear from American manufacturers of heavy duty trucks, capable of carrying heavy loads and drawing a train of trailers as well. File No. 10,236. A business man in Portugal desires to act as agent for an American automobile manufacturer. He states that he has had experience in the automobile business. The machines must be good hill climbers and able to stand hard usage. Correspondence may be either in Portuguese or French. File No. 10,164. A foreign business man desires to receive catalogs, prices, shipping weights and measurements of the better grade of American automobiles. He is now agent for a large line of machinery. File No. 10,290. An American consular officer in a European country reports a good market for American automobiles in his district. A number of American cars have already been sold there, and a local sporting goods house desires to obtain the agency for a car. Correspondence in English. File No. 10,149. A report from an American consul states that a resident of his district desires to hear from American manufacturers of automobile tires. He desires to represent them in his country, either as general agent on a commission basis, or as exclusive selling agent. Correspondence in Italian, French or Spanish. File No. 10,309. An American consul has compiled a list of the automobile dealers and garages in his district, where American cars have had considerable success. There is a good field for increased sales, the machines being already held in high esteem. The list, as well as any of the other reports, may be had from the Bureau of Foreign and Domestic Commerce. File No. 10,322. An American now in business in a thriving agricultural manufacturing province in Europe informs an American consulate that he would like to secure an agency for a cheap runabout that can be converted instantly into a delivery wagon. He saw such a vehicle several years ago in the United States which sold for not more than \$500. He is sure that a considerable business can be done with it among the farmers, but will not consider a more expensive car. Those interested will receive all information wanted by addressing the Bureau of Foreign and Domestic Commerce and by referring to File No. 10,391. An American consular officer reports that the owners of an automobile and mechanic workshop in his district desire to enter into correspondence with American manufacturers of small automobiles of 6 to 8 horsepower, accommodating two or three persons, strongly built and attractive, which could be sold for \$1,000 or less. This firm is of the opinion that such a car would be in great demand, which has not yet been apparent because cars of this type have not yet been offered for sale. This company is willing to pay cash on delivery. American manufacturers of the type of cars described would do well to write at once to this firm, giving lowest terms and conditions of sale. Correspondence may be in English. File No. 10,524.

Automobile Incorporations

CLEVELAND, O.—Cleveland Speed Indicator Co.; capital, \$10,000; to manufacture and deal in speed indicators of all kinds. Incorporators: Arthur Friedman, Leo Friedman, Marshall R. Stewart.

DOVER, DEL.—Morgan & Marshall Co-Operative Rubber & Tire Co.; capital, \$50,000; to manufacture rubber tires. Incorporators: R. J. Marshall, Ila P. Marshall, Morgan Howell.

EAST ORANGE, N. J.—F. C. D. Inner Tube Protector Co.; capital, \$150,000; to manufacture automobile tires. Incorporators: Gilbert H. Field, James H. Christian, Thomas Dick, and Harry H. Pickings.

HARTFORD, CONN.—Hartford Auto Pump & Supply Co.; capital, \$50,000. Incorporators: Henry P. Schale, Edward E. Tryon, Thomas Lockwood.

MCOMB CITY, MISS.—Causey's No-Leak Mfg. Co.; capital, \$1,000; to manufacture tire fluid.

MUNCIE, IND.—Derrickson Mfg. Co.; capital, \$125,000; to manufacture a puncture proof compound for tires. Incorporators: H. S. Osborn, H. L. Kittelman, R. C. White.

NEW YORK, N. Y.—American Road Machinery Co.; capital, \$1,000,000; to manufacture road machinery.

RICHMOND, O.—Sedgwick Mfg. Co.; capital, \$10,000; to operate a factory for the making of a jack device for lifting automobiles from the ground. Incorporators: Richard Sedgwick, J. R. Sedgwick, James M. Judson.

ROCHESTER, N. Y.—Central Motor Supply Co.; capital, \$30,000; to deal in electrical and mechanical devices. Incorporators: P. B. Barager, R. F. Glose, W. Wood, C. W. Gallinger.

ROCHESTER, N. Y.—Zimbrich Taxicab Co.; capital, \$3,000. Incorporators: Herman J. Zimbrich, Alexander G. Wall, Fred Simmons.

TOLEDO, O.—D. & A. Paint Mfg. Co.; capital, \$30,000.

VICTORIA, TEX.—Park Garage; capital, \$10,000. Incorporators: Wilford B. Smith, Harry U. Campbell, Geo. Clifton Edwards.

CHANGES OF CAPITAL AND NAME

BOWLING GREEN, O.—Bowling Green Motor Car Co.; capital increased from \$50,000 to \$100,000.

CHICAGO, ILL.—Automobile Construction Co.; capital increased from \$27,000 to \$100,000.

CLEVELAND, O.—Pennsylvania Rubber & Supply Co.; capital increased from \$25,000 to \$75,000.

COLUMBUS, O.—Midgley Mfg. Co.; capital decreased from \$250,000 to \$25,000.

COLUMBUS, O.—Rogers Supply & Tire Co.; capital, increased from \$10,000 to \$25,000.

DAYTON, O.—Air Friction Carbureter Co.; capital increased from \$20,000 to \$30,000.

EAST PALESTINE, O.—McGraw Tire & Rubber Co.; capital, increased from \$100,000 to \$1,000,000.

TOLEDO, O.—Mather Spring Co.; capital, increased from \$100,000 to \$300,000.

TOLEDO, O.—Rapp Mfg. Co. will change its name to The Toledo Spark Plug Co.



Patents Gone to Issue

COMBUSTION Motor Valve—Consisting of two concentric horizontal sleeves in the cylinder heads, which are divided by vertical partitions into three chambers.

The subject matter of this patent, consisting of two concentric, horizontal sleeves formed with transfer ports and positioned in the heads of a pair of cylinders is shown in Fig. 3. A valve chamber is formed across the highest portion of the combustion space and an outer sleeve O and an inner sleeve I are concentrically mounted in this chamber with a clearance just sufficient to permit of reciprocation of the sleeves. Two partitions divide the inner sleeve into two exhaust compartments and one inlet compartment and ports P E and P I in the cylinders serve to provide transfer passages between the combustion chambers and the exhaust and intake manifolds respectively. The sleeve valves are operated by means of a gearing G, consisting of a bevel gear driven off the crankshaft and two connecting-rods pinned eccentrically to the driven bevel gear, and each being connected to one of the sleeves.

No. 1,053,894—to Robert H. Adams, Detroit, Mich. Granted February 18, 1913; filed November 25, 1911.

Movable Headlight Support—Consisting of a cross-rod connected to the steering mechanism and operating the rotatable lamp supports by yokes.

The device described in this patent Fig. 4 includes a pair of bearing brackets carried by supports, lamp supporting shafts S which are mounted in the brackets B and yoke members carried by the shafts S. Means for imparting rotatory motion to the operating members O consist in links which connect O to the steering mechanism, oscillating the ends of the members O when the steering gear is operated.

No. 1,053,832—to Ned Gensemer Krimmel, Pine Grove, Pa. Granted February 18, 1913; filed April 16, 1912.

Tire Construction—Being formed with two annular air spaces in the casing which preserve the shape of the inner tube.

This tire consists of an inner case C, Fig. 5, a tread T which is formed with a rib engaging C at its periphery and an intermediate case formed between the tread T and the case C. This intermediate is composed of a portion O and an inner portion I which are spaced at their centers so as to form a pair of air chambers A extending all around the tire. The inner and outer portions are engaged in the rib and their ends are held in close contact by the tread and the case C.

No. 1,053,238—to George A. Stewart and Harlan E. Goodell, Ridley Park, Pa. Granted February 18, 1913; filed January 23, 1912.

Automobile Spring Tire—In which circumferential and radial coil springs supplant the resiliency of the pneumatic tire ordinarily used.

As Fig. 1 shows the tire described in this patent is of the coil spring class and consists of an inner rim I and an outer rim O, which are mounted concentrically on the wheel felloe and between which the resilient springs are contained.

There are two kinds of springs. The first kind S has the spring ends in engagement with the hooked ends of elements E which are fastened to the outer rim O, by means of serrations engaging oppositely formed serrations on the inner face of the rim O. The inner rim I carries on its outer surface an annular series of studs S I at which compression springs C are mounted, the outer ends of which are secured to eyes formed in blocks B, which latter are fastened to the elements E carried by rim O. It is seen that the compression springs C take the place of the inflating air used in pneumatic tires, while springs S keep the elements E from mutual displacement and the outer rim O, which carries the tread of the tire, from deformation.

No. 1,053,707—to Samuel J. Casey, Keeseville, N. Y. Granted February 18, 1913; filed April 5, 1912.

Electric Spark-Plug—The insulated electrode is inclosed in a tapered metal sleeve fitting into a tapered shell.

The spark-plug, Fig. 2, consists of a metal shell S which has a tapered opening and is provided with longitudinal grooves in the walls of the inner end thereof. A tapered metal sleeve M is removable fitted into the shell S, M being formed with an outer flange in the handle H projecting from the same and through the use of which the sleeve M may be turned inside the shell S. M is formed along its side surface with off-standing lugs passing through the grooves of the shell. Inside the sleeve is a core of insulating material I surrounding an electrode passing through the entire length of it; a second electrode E through which the ignition current returns to its source is secured to the metal sleeve as shown.

No. 1,053,470—to Frank R. Blake, Malden, Mass., assignor to Blake Spark Plug Co., Boston, Mass. Granted February 18, 1913; filed January 24, 1912.

Carburetor Construction—Having air and fuel regulation valves operated by the same means.

This carburetor has a venturi tube, a fuel supply which discharges into the smallest part of that tube and a valve for the discharge. An air valve is located in the outer end of the venturi tube and it is adapted to control the pure air which enters the tube. Means for connecting both valves are provided.

No. 1,055,042—to William H. C. Higgins, Jr., Laporte, Ind. Granted March 4, 1913; filed August 20, 1910.

Automobile Headlight—For electric lamps.

In the headlight described in this patent an annular sleeve is secured to the rear end of the reflector and has a longitudinally extending recess serrated on one side. A curved spring member is secured to the sleeve and at its free end is provided with a slotted guideway adapted to register with the recess, but of less width than the latter. A socket member extends through the sleeve and has a locking lug projecting through the recess mentioned, a terminal plug being connected to the rear end of the socket and a bulb to the front of the terminal.

No. 1,054,746—to Walter E. Christian, Kenosha, Wis. Granted March 4, 1913; filed May 27, 1912.

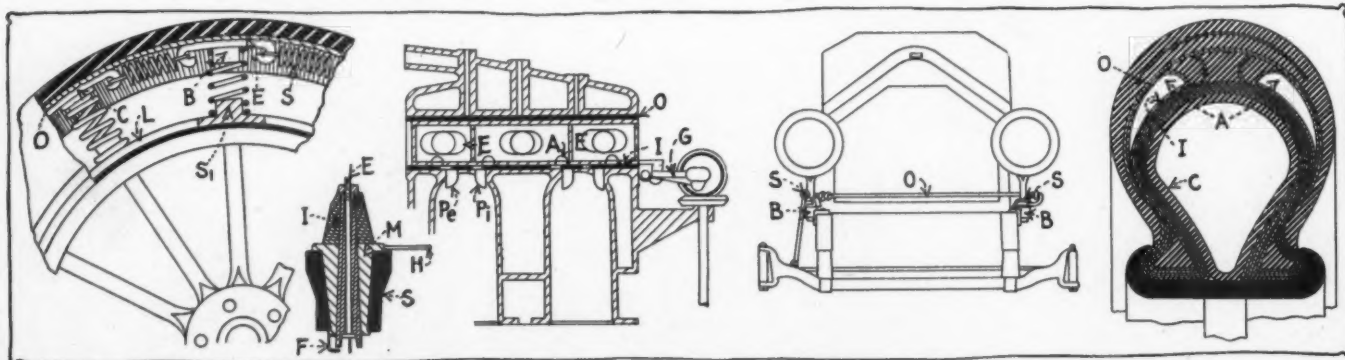


Fig. 1—Casey spring tire. Fig. 2—Blake spark-plug. Fig. 3—Adams motor valve. Fig. 4—Krimmel movable headlight support. Fig. 5—Stewart & Harlan tire construction.

NEW YORK, MARCH 20, 1913

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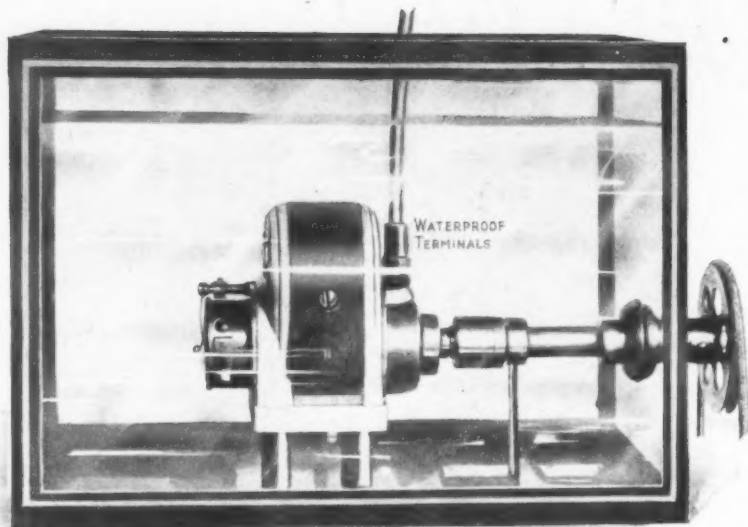
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